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The American Marine Congress

IF the approaching Marine Congress can, as the result of its deliberations, line up the many and varied interests directly concerned in, or contributing to American seaborne trade, if it can formulate a United States shipping policy which will solve present problems and establish a firm foundation upon which the American flag may be permanently established on the seas, it will have accomplished its purpose and will have rendered the country a service of unparalleled value.

To a far greater extent than has prevailed at any previous convention, this congress will represent the general business interests of the country, and its work will embody the results of serious consideration on the part of bankers, manufacturers, railroad executives, representatives of agricultural organizations, exporters and importers; in short, of representatives of every form of commercial activity having interest in the country's ocean trade.

While the sum total of those directly engaged in maritime pursuits is relatively small and, by itself, limited in the accomplishment of political or national ends, the coming congress will represent a very large proportion of the business activities of the entire country. Under the guidance of its chairman, Secretary of Commerce Hoover, its deliberations will assume a broadly national aspect, and their result should be a shipping policy back of which the united business of the country can stand.

Approximately one hundred organizations have signified their intention of participating, the delegates comprising men nationally known in almost every important industry. Coordinated by Mr. Hoover's unexcelled genius for organization and administration, the results of the deliberations of this unusual body of men may well prove epoch making in the history of the American merchant marine.

The Shipping Board's Policy

THE statement of the chairman of the Shipping Board, published elsewhere in this issue, gives an outline of the problem confronting that body. It is our experience that the chairman, personally, is a clear and concise thinker. That he has a comprehensive idea of the end to be sought from the Government's viewpoint is unquestionably true; but with six associates, with six different minds on many phases of the problem, there is little hope for an immediate solution. Further, since the board is essentially political and the policy of the Government seems to be that of persisting in holding the reins instead of disposing of the vessels and routes in a businesslike way, there is no prospect of early relief from the financial burden and hindrance to shipping involved in any continuance of the Shipping Board and its appendix vermiformis, the Emergency Fleet Corporation.

There is nothing in the program of the Shipping Board as given in Mr. Farley's communication that could not be carried out by private owners; and there is no necessity for continuing a great mass of expensive machinery for further experimental purposes. However, since the gods have decreed otherwise, what is the alternative?

Mr. Farley has made it clear that the Shipping Board will continue to operate ships indefinitely. But how about getting rid of useless vessels which, so long as they are riding at anchor, are derelicts in the shipbuilding industry?

A considerable number of ships have been disposed of; but a far larger number remain on the board's hands. Many of the latter are competitive or could be made so by changes in their machinery; but after deducting all ships of actual or potential commercial value there still remains a depressingly large fleet for which, even when looking into the future, no conceivable use is apparent. Some definite disposal of the mass of useless tonnage, and that at once, would appear to be the first and obvious step in the solution of the Shipping Board's problems. It is something which will have to be done eventually, and there is no good reason for further delay.

Turning to the competitive vessels, it is the intent of the

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Jones Act and is understood to be the purpose of the board, as at present constituted, to dispose of them at the earliest possible moment to private parties.

The valuation of the board's fleet, recently published, works out to a considerably smaller unit price than that at which the ships have heretofore been held, but so far as we are aware no change in sales policy has been made. It seems to us that the time is opportune for pricing the vessels individually and at such a figure that their purchase by private interests would be within the limits of good business judgment.

Local Strength of Steel Ships

THE enormous energy stored up in a moving vessel, as well as the ability of a well-constructed steel ship to endure the severest punishment and successfully localize its effects, are well illustrated by the photographs of the damaged steamers *Hoven* and *West Arrow* which are reproduced elsewhere in this issue. In each vessel, notwithstanding the severity of the blow received, the damage was mainly confined to its immediate vicinity. In the case of the *Hoven* the longitudinal framing of the hull undoubtedly contributed to a considerable extent to this result. One cannot but wonder how much more extensive the damage might have been, had it not been for the heavy longitudinals which received the impact very nearly on end.

The results speak well for the character of material and workmanship entering into the construction of both vessels and should go far to set at rest the doubts entertained in some quarters as to the quality of the steel of which the Shipping Board vessels were constructed.

A Real Opportunity

THE present Government shipping situation, discouraging as it appears to the private owner and operator, has one hopeful side and presents a condition which, if opportunity is given in a proper and businesslike manner, may be developed in such a way as to be of the utmost advantage to the American merchant marine.

As described in detail elsewhere in this issue, a considerable portion of the Shipping Board's fleet is available for conversion to Diesel drive. These ships are of good design, so far as their hulls are concerned, and are at present in a fair state of preservation. We believe, if the board were to put in practice the methods of advanced modern salesmanship, that the potential value of the converted Diesel ships would be shown in a most convincing way.

The opportunity is at hand for the development of an American fleet of motorships at a cost materially less than is possible in any other country. It will be little short of a national calamity if, as the result of present depressed trade conditions and the consequent hesitancy of capital to embark in marine undertakings, this opportunity is allowed to pass unheeded.

By all means the Construction Loan Fund, now held by the Shipping Board for building purposes only, should be made available for the conversion of tonnage to Diesel drive and such legislation as is necessary to this end should be enacted at the coming session of Congress. With the difficulties of capitalization thus relieved, there appears no serious obstacle standing in the way of placing competitive American motorships on the high seas and, at the same time, by the consequent increase in production of Diesel engines, enabling the builders of this class of machinery to approach more nearly to manufacturing conditions and the resulting reduction of cost.

The main and most frequently expressed objection to Diesel machinery is its present high cost and by enabling the builders to reduce this as the result of increased business is a matter second only in importance to the "Dieselizing" of these otherwise unproductive vessels.

It seems to us that along this line there is more of promise to American shipping than by any other channel now open.

The English Cinch

OVERTURES have recently been received from the British market by American hull underwriters, suggesting cooperation in preventing a further reduction in rates and values on hulls. The communication has been received from the Institute of London Underwriters and contains a recital of the understanding reached by London Underwriters as embodied in the following resolution:

"That in future no reductions in rates shall be given and no reduction in values without proportionate additional premium. This resolution to apply to steamers of any flag and also to renewals of foreign reinsurance placed in this market but not T. L. O. insurances."

The irony of this appeal can scarcely escape anyone familiar with the hull situation. It will be recalled that immediately following the cessation of hostilities in the world war the British underwriters notified the American market of the abrogation of their agreement to respect advisory ratings on American bottoms as promulgated by the American Hull Association. The object of this peremptory action was unmistakable. The American market, during the war, had obtained a large share of the American hull business, and the British underwriters wished to be free to recover as much of the business as possible, and did not want any impediment to this end so that they might obtain the business at whatever rate or on whatever conditions necessary.

The British market, because of its scope and financial backing, was in a position to capture the business regardless of the cost. We all remember the facility with which they accomplished their object. Rates were cut to a point where American underwriters, never very keen for hull business, were willing to have the business pass out of their hands, realizing that they could not hope to compete with the methods of the British market.

For five years British underwriters have paid through their nose for their grasping methods and have at last reached the point where they feel that a halt must be called. They now seek to consolidate and make profitable their gains and have the effrontery to call upon foreign underwriters for cooperation in retaining the business which they took in such a ruthless manner. It is to be hoped that American and other foreign underwriters will know how to treat such an appeal.

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American Trade Needs American Ships

History Proves the Necessity for, and Common Sense Demands the Use of, American Ships for Developing Our Foreign Trade

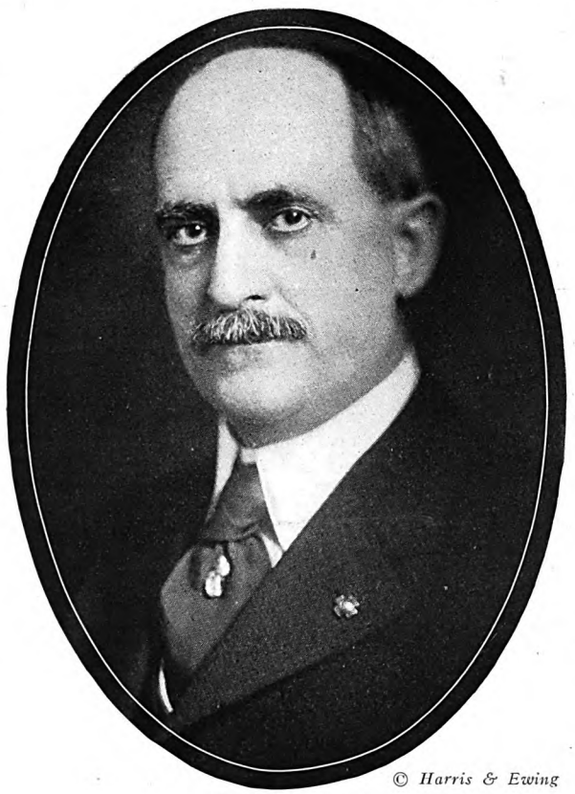
By E. C. Plummer
Commissioner, United States Shipping Board

IN discussing our country's "great embargo" ordered by Congress on December 22, 1807, the *Americana* (Vol. 10, Page 273), states: "The agricultural classes who controlled the administration did not believe in commerce and preferred abolishing it to spending anything for its protection."

The broader views, which have come through a century's education, cause us to stand astounded before the proposition that there ever could have been a time when a majority of our people, either by affirmative declarations or by equally effective acquiescence, preferred to abolish our foreign commerce rather than to incur any expense for its preservation; yet an equally incomprehensive attitude toward American ships for our foreign trade dominates United States policies today!

American Citizens Lack National Vision

The need of foreign trade for the United States is recognized by all. The necessity for foreign markets where our surplus goods may find an outlet is understood by many, but the fact that American ships are absolutely essential to the proper development of such markets appears to be understood by but a few, if we may judge popular comprehension by results actually attained. Until there has been legislation which actually puts into the foreign trade of this country ships owned and operated by citizens of the United States the people of this country, whatever their private views may be, must stand charged with the same lack of national and commercial vision as brought about the legislation of 1807-1809, and ended in war.



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E. C. Plummer

What Our Competitors Know

Our competitors clearly perceive the mistake this country is making. Says *Fairplay,* England's marine journal, quoting Britain's commercial authority (September 20, 1923):

"One cannot but be struck with the comparatively small amount of United States foreign exports in comparison with the colossal production of that country. * * * The question which the United States will presently have to answer is to what extent her manufacturers can rely on home consumption for a market for their goods. * * * How long this somewhat artificial prosperity will last is quite another question. If there is no market for dumpable surpluses, they will not represent wealth; and in such case the effort will be as wasted as our own in 1920, when we produced more than we could sell here and abroad, with staggering consequences."

The vast unemployment, on account of which England has spent millions upon millions, is one of the "staggering consequences" referred to here—and the end is not yet!

The exhaustion of all our surplus supplies brought about by the world war and the great deficiency in building operations which we are now engaged in supplying have created a home market which has placed American labor in a very advantageous position; and it is the part of wisdom for us to take such action now as will enable us to keep that labor fully employed when our exceptional industrial activities shall have become normal, as they necessarily will become within the next five years.

Operation of American Ships Pays $100,000 Per Day to American Labor

Here the importance of a foreign trade merchant marine as a United States industry in itself should be considered. The wages paid on Shipping Board vessels in that trade alone is eighteen million dollars a year. The voyage repairs on those ships alone amount to twelve million dollars per year. These two items alone, to say nothing of supplies and equipment replacements, mean one hundred thousand dollars per day in wages paid to American labor. And ships in their construction and upkeep call upon practically every industry for a contribution—everything that goes into the building of a home or a hotel is to be found in a modern steamship. This is only the constant, day-by-day employment resulting from ship operation. It does not include the vast employment created by ship building.

Now we come to the persistently iterated fallacy that there are always foreign ships enough to handle properly all the foreign trade of the United States.

Foreign Ships Will Not Provide Proper Transportation for Our Goods

That, as a rule, there are ships enough under foreign flags to furnish transportation for American goods may be admitted; but that they have furnished, or will furnish, *proper* transportation facilities for our goods is not true. Take this admission made in *Fairplay* on August 30, last, discussing the movement of only one of America's great staples, cotton. It says:

"The Americans often found that there were no boats available

(*Continued on page 652*)

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American Ships Are Carrying Less Than 25 Percent of the Overseas Commerce of the United States

Figures Supplied by the Research Department of the Shipping Board Show That the Majority of Our Exports and Imports Is Handled by Foreign Shipping

THE merchant marine of the United States may properly be divided into four distinct classes according to the services in which employed.

(1) The ocean going vessels of one thousand gross tons and over employed in the foreign trade of the United States.

(2) Vessels of 500 gross tons and over employed in the coastwise and intercoastal trade, in offshore traffic.

(3) Vessels employed on the Great Lakes exclusively.

(4) Vessels employed on inland rivers, land locked lakes, inland bays, and inshore traffic.

Of the four classes the first is the one to which we look to establish and maintain our position as a maritime nation in times of peace and to provide us with adequate transportation in time of national peril. The foreign going ship is the one that must meet the competition of other nations for the carrying trade of the world and, in a survey of the activities

American Trade Needs American Ships

(*Continued from page* 651)

for them in the summer months. The Shipping Board has supplied that deficiency. * * * the want of regular sailings had been in existence for many years, but the European carriers had made little effort to supply it."

There's an admission by the spokesman of our chief competitor in world trade! This attitude has been typical; and it is one of the principal reasons why there has existed that "comparatively small amount of United States exports," cited by the British commercial authority above referred to.

Foreign Discrimination Against American Trade

But there has been something more than mere neglect. A few years ago Senator Fletcher, of Florida, exposed in the United States Senate the discriminations which, by increasing the freight charges on American cement sold to South American purchasers, made it impossible for that United States product to compete with the far more cheaply transported British product; and that case where the sale of fifty American-built locomotives to Argentine purchasers was defeated by an increase of three dollars per ton in the ocean freight rate on them will readily be recalled.

The recent exposure by our Postmaster General of the systematic detention of mails to the United States that they might go on British ships, ignoring available American tonnage, speaks for itself.

I am offering no criticism of such practices as those referred to here—on the contrary, I admire the wisdom of Britons who realize the necessity of their giving every possible bit of business to their ships and to their manufacturers. I cite these facts merely as showing how foolish is the claim that foreign ships can or will serve the people of the United States as well as ships belonging to and operated by our own people. Now for a concrete case showing how American ships build up the foreign trade of this country.

How American Ships Build Up Our Foreign Trade

When the United States had recovered its commercial equilibrium following the civil war era, the United States and Brazil Steamship Company was established. As soon as it had shown material results in building up American business with the east coast of that continent sharp competition was established by Europeans, and in 1890 the line was driven out of business. Then, as now, the extra cost of operating ships under the American flag was a fatal burden which Congress had imposed but refused to share. The net result was that Europeans became predominant in foreign trade then so that at the beginning of the world war Great Britain had engaged in trade with the east coast of South America alone more tonnage than she had with the east coast of the United States, Canada and all the West Indies combined (Page 141, Report to Parliament, 1918).

Following the world war United States vessels established a regular and high-class service to the principal ports of Brazil and Argentina, with a result which may well be stated in the words of Sir John E. Thornycroft, whose recent report—appearing in *Lloyd's*—says:

"The Americans are pushing everywhere and taking control. Large orders for locomotives, for coal plants, grabs, etc., have recently gone to the United States, and a new steel factory is equipped with American machinery, while it is probable that large orders for electrifying the State Railways will also go to America."

Commerce with the Far East Increased by American Ships

Take Oriental ports to which the Shipping Board now operates two first-class lines of steamers, the Admiral and the Pacific Mail. In 1914 our total commerce with the East amounted to but 2,418,654 tons, of which less than 10 percent was carried by American vessels. That trade has increased to 5,255,000 long tons, of which 55 percent is carried in American vessels.

Unquestionably American ships are essential to the proper development of our foreign trade; unquestionably the heavy losses which Shipping Board vessels have suffered during this continuing period of depression in ocean freight rates have been much more than made up to our people in savings on transportation charges paid by our exports and imports (grain having been carried this year at as low as six cents per hundred weight), as well as in the development of foreign markets for our products; and since the cost of operating American ships is from seven to ten percent higher than the costs of their competitors, as a result of American standards, unquestionably the Government should put our ships on an equality with their competitors, just as it does in the case of other great industries, so that the Shipping Board ships may be sold and private enterprise given an opportunity to develop the foreign trade of this country, which trade within five years will prove to be one of the very essential pillars of this country's prosperity.

Correction.—On page 618 of our October issue the captions of Figs. 7 and 8 in the paper on Scotch boiler tests were inadvertently interchanged; *i.e.*, the higher efficiency curve applies to the forced draft test and the lower efficiencies to the induced draft.

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of American merchant vessels and their employment, is the only class in which comparisons can be made that would indicate the growth or recession of our position as a factor in transporting the manufactures and products of our own country, the raw materials necessary to our industries, as well as the manufactures of other nations.

GROWTH OF MERCHANT FLEET

The past decade has witnessed the growth of our steam merchant fleet (exclusive of Lake vessels) from 725,000 gross tons on June 30, 1914, to 11,600,000 gross tons on July 1, 1923. Practically the whole of this increase is due to the construction program of the United States Shipping Board.

The total gross tonnage of our vessels is not a conclusive measure of their usefulness, however, as many of the vessels registered for foreign overseas trade are laid up and in the instance of the wood vessels condemned for salvage although still remaining in the documented lists. The measure of our activities in foreign trade lies in the consideration of those vessels of 1,000 gross tons and upward in continuous service on regularly established routes, that are the carrying factors of our ocean transportation system.

DIVISION OF FOREIGN TRADE

The foreign trade of the United States falls naturally into two divisions—first, trade with foreign ports of North America, Central America, Mexico, West Indies, and other foreign islands of North America to which voyages are relatively short and the tonnage requirements in relation to the volume of cargo carried are considerably less since the turnaround is more frequent, and, second, the overseas voyages to Europe, Africa, Asia, Australia, the islands of the Pacific and South America where the annual turnaround is greatly reduced and the tonnage requirements in proportion to the cargoes carried are much greater.

At the end of the fiscal year, June 30, 1923, there were employed in the trade with the nearby foreign regions 39 passenger vessels of 168,417 gross tons, 78 cargo vessels of 220,118 gross tons and 72 tankers of 369,893 gross tons—a total of 189 vessels of 758,428 gross tons. These vessels carried in June of this year 557,000 long tons of dry cargoes or 46 percent of the total regional commerce with the United States and 952,000 tons of oil or 77 percent of the total imported. The combined traffic with the nearby regions amounted to 2,446,000 long tons of which American vessels carried 1,509,000 tons or 61.7 percent.

VESSELS IN OVERSEAS SERVICE

In the long haul traffic of overseas trade the employment of American vessels and the proportionate cargo carried is best illustrated by subdividing the trade into continental regions and the following tables illustrate the tonnage engaged at the close of the fiscal year and its distribution and the amount of the regional proportion of commerce carried by American vessels.

Overseas Employment of American Steam Vessels of 1,000 Gross Tons and Over On June 30, 1923

American Flag	Passenger No.	Passenger Gross Tons	Cargo No.	Cargo Gross Tons	Tanker No.	Tanker Gross Tons	Cargo Carried June, 1923, Long Tons	Percentage of Total Cargoes	Regional Total Vessels Employed No.	Regional Total Vessels Employed Gross Tons
South America—										
East Coast	7	85,973	30	163,088	4	25,834	106,053	30	41	274,895
West Coast	4	19,578	20	99,285	1	7,110	97,924	44.3	25	125,973
	11	105,551	50	262,373	5	32,944	203,977	35.6	66	400,868
Europe—										
Atlantic	20	298,271	153	861,906	12	76,870	455,076	25.8	185	1,237,047
Baltic	..	.....	13	64,841	3	19,434	25,329	9.9	16	84,275
Mediterranean	1	5,083	40	208,133	1	5,106	72,000	14.8	42	218,322
	21	303,354	206	1,134,880	16	101,410	552,405	22	243	1,539,644
Africa—										
West Coast	..	.....	7	37,214	..	.....	8,153	41.9	7	37,214
East Coast	..	.....	7	41,783	..	.....	10,796	25.6	7	41,783
	..	.....	14	78,997	..	.....	18,949	36.7	14	78,997
Asia—										
Orient	12	154,735	64	399,066	11	78,588	148,423	41.5	87	632,389
Far East	..	.....	13	79.023	4	30,304	35,343	23.6	17	109,327
	12	154,735	77	478,089	15	108,992	183,766	36	104	741,716
Australia	2	12,561	13	77,053	..	.....	14,886	18	15	89,614
Around world	..	.....	6	38;781	..	.....	.....	..	6	38,781
Total overseas	46	576,201	366	2,070,173	36	243,246	973,983	24.7	448	2,889,620
Nearby Countries and Domestic Trade										
Mexico—West Indies and Caribbean	39	168,417	78	220,118	72	369,893	.....	..	189	758,428
Coastwise—										
Atlantic	44	170,390	153	497,440	69	369,670	.....	..	266	1,037,500
Pacific	29	80,655	77	149,567	25	138,356	.....	..	131	368,578
Intercoastal	7	36,385	154	885,685	113	875,166	.....	..	274	1,797,236
Porto Rico	6	22,453	15	45,142	..	.....	.....	..	21	67,595
Hawaiian	11	68,606	7	31,435	5	28,680	.....	..	23	128,721
Total nearby and domestic	136	546,906	484	1,829,387	284	1,781,765	.....	..	904	4,158,058
Summary										
Total active vessels	182	1,123,107	850	3,899,560	320	2,025,011	.....	..	1,352	7,047,678
Laid up and inactive	23	192,534	975	4,017,724	60	289,214	.....	..	1,058	4,499,472
Total fleet	205	1,315,641	1,825	7,917,284	380	2,314,225	.....	..	2,410	11,547,150

The vessels of the United States Shipping Board predominate in the overseas trade, the ratio being about 5 tons of Government owned vessels to 1 ton privately owned, this ratio of course varies in the different regions. Where the maintenance of services would be unprofitable for private capital, and markets and transportation by American vessels must be established and maintained, the Shipping Board vessels have been kept in continuous service despite the fact that they have operated without profit, as for instance in the transatlantic European services, where the keenest competition is met from maritime nations whose operating costs enable them to carry cargoes at the lowest ebb of freight rates, either at a small margin of profit or with an even break, the privately owned tonnage of the United States is represented by 52,879 gross tons while the Shipping Board maintains in this service a total tonnage of 1,075,687 gross tons of cargo vessels.

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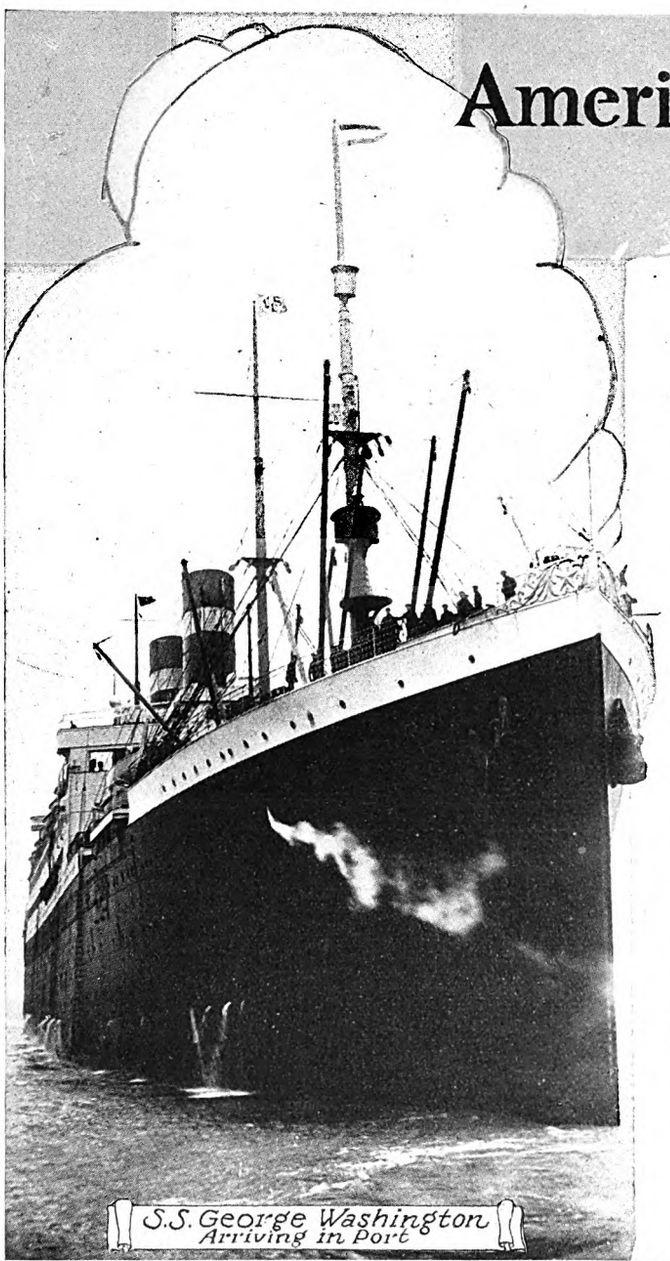
American Passenger Ships



S.S. George Washington
Arriving in Port

TO an American, the crossing of the Atlantic for the first time on a vessel flying his country's flag is an event fraught with significance and one calculated to stimulate a train of thought not otherwise awakened.

Particularly is this true with one whose whole business life has been spent in close touch with the shipbuilding industry and to whom the Stars and Stripes at the peak of a fine transatlantic liner represents the fulfilment, at least in part, of a life-long hope.

North Atlantic the Premier Steamship Route of the World

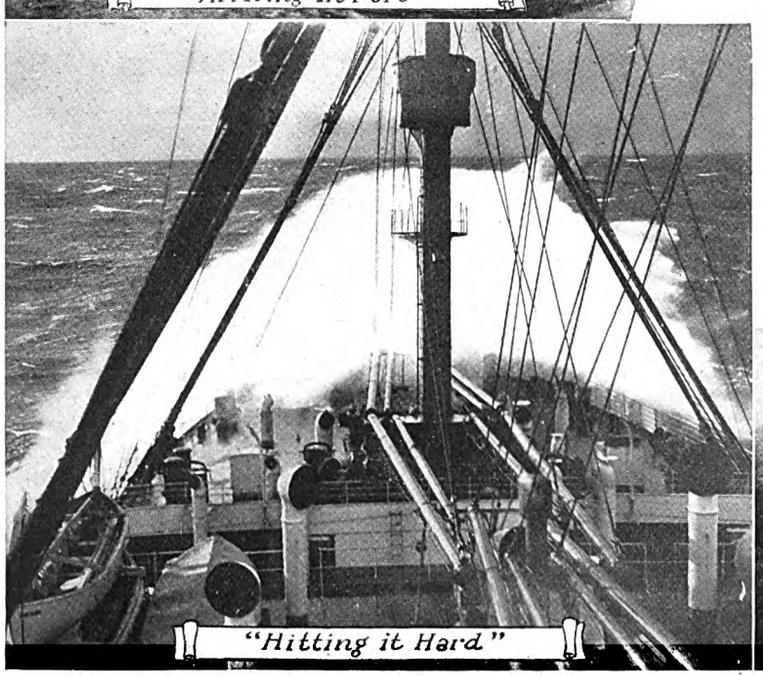
Of all great ocean routes, that between Europe and North America is the most important; and it is here that commercial naval architecture and marine engineering have attained their highest development—in size of ships, speed, luxurious accommodation and safety. The blue ribbon of the North Atlantic is the blue ribbon of the maritime world.

In the sailing-ship era, American vessels, both as regards size and speed, held the Atlantic records for many years; but it is no part of the writer's intention to present a history of the decline of our merchant marine in overseas trade. The fact that the low point has been passed and that America is now in a fair way to regain at least in part her former enviable position on the North Atlantic makes more cheerful reading and the story of what has already been accomplished, however imperfectly it may be told, is of vital interest to all Americans who have at heart the welfare of their merchant marine.

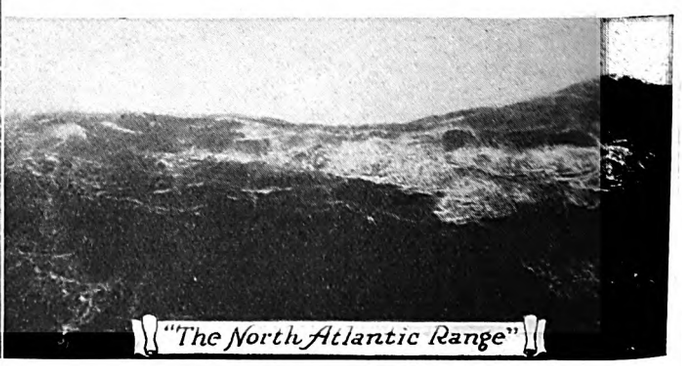
United States Lines a National Institution

As is well known, the Shipping Board, through the United States Lines, has for the past two years been operating vessels in the North Atlantic passenger trade. It would appear, however, that the character and the extent of the service rendered by these lines of steamers are not as well nor as generally recognized as they deserve to be, although the popularity of the service has increased by leaps and bounds during the past summer. The reports of passengers who have made passages by these vessels, and the writer has talked or been in communication with many of them, are practically unanimous as to the high quality of the service rendered and, in the minds of a steadily growing number of Americans, the line is established as a national institution.

As at present conducted, the United States Lines are operating the following vessels:



"Hitting it Hard"



"The North Atlantic Range"

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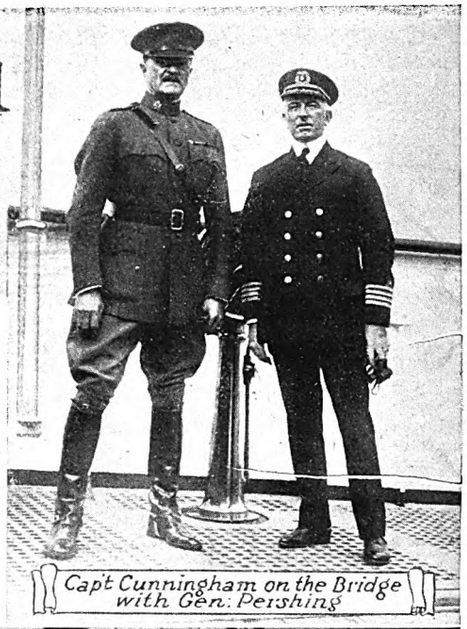
Setting a High Standard

James Swan

Leviathan, New York-Cherbourg-Southampton; *George Washington, America, President Roosevelt, President Harding, President Arthur* and *President Fillmore,* New York-Plymouth-Cherbourg-Bremen-Southampton; and four smaller vessels, *President Polk, President Monroe, President Adams* and *President Van Buren,* between New York, Plymouth and London, two of them calling also at Queenstown.

The *Leviathan* is too well known and has been too often described to need any further comment at the present time. She is one of the world's finest ships, and after a period of special management, has just been taken over by the United States Lines, and will undoubtedly be run by them in the efficient manner which has built up the popularity of their other vessels.



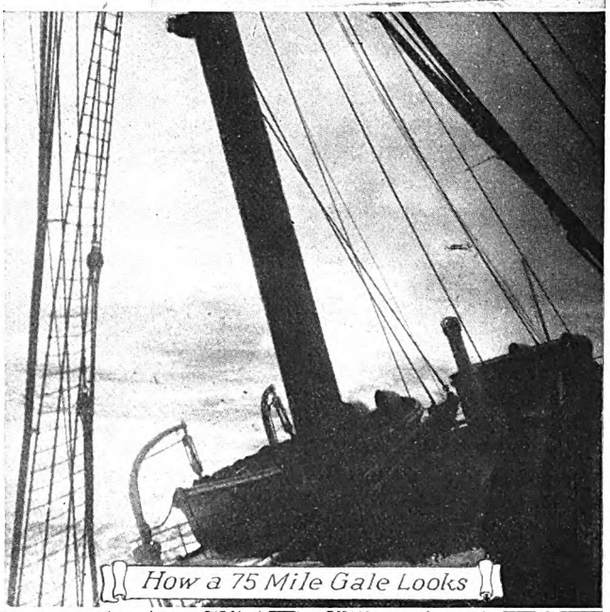
Capt Cunningham on the Bridge with Gen: Pershing

The George Washington Popular with Travelers

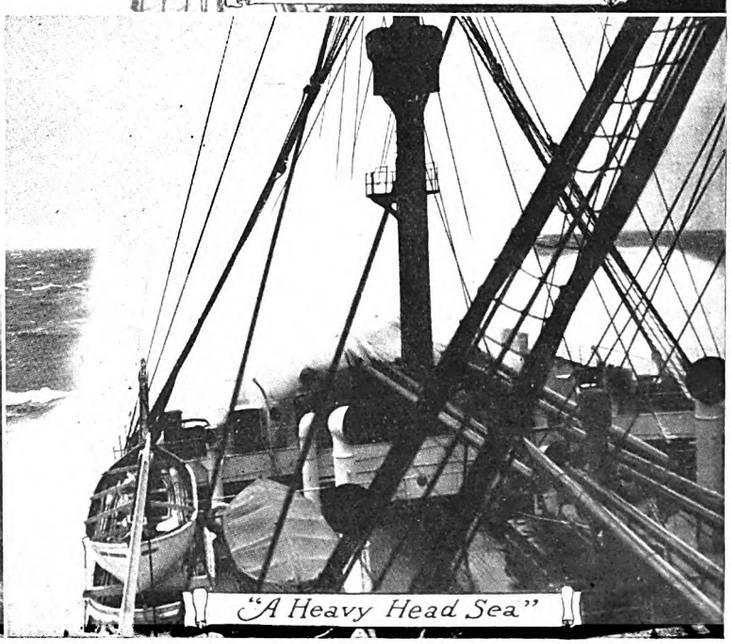
In the *George Washington,* the line possesses, thanks largely to its own efforts, what is perhaps the most popular vessel with American travelers in the Atlantic service today. This fine ship is an intermediate type steamer of 23,788 gross tons, approximately 20,000 horsepower and over 17 knots' speed in average weather. For solid comfort it is hard to imagine anything more nearly perfect than this ship. The decks and cabins are spacious, the public rooms well arranged, comfortably furnished and well finished and decorated, but without the excessive decorative and lavish and really unnecessary detail which to many appears out of place on shipboard. Furthermore, the vibration and discomfort often experienced in heavy weather on very high powered ships are practically absent.

The writer has recently had the good fortune to make a round trip on the *George Washington,* the trip east unusually smooth and the return in heavy weather. The behavior of the ship in the heavy head sea was perfect and clearly showed the superior comfort of the intermediate type ship under rather trying conditions. So far as management and the internal running of the ship were concerned, there was nothing but praise from everyone—for the veteran captain and for all of his efficient and smooth running organization; and it is pleasing to know that this state of mind is also reflected by those who have traveled on the other vessels of the line, several fellow passengers telling the writer that they had experienced equally pleasant and satisfactory service on the *America,* the *President Roosevelt* and on the London ships.

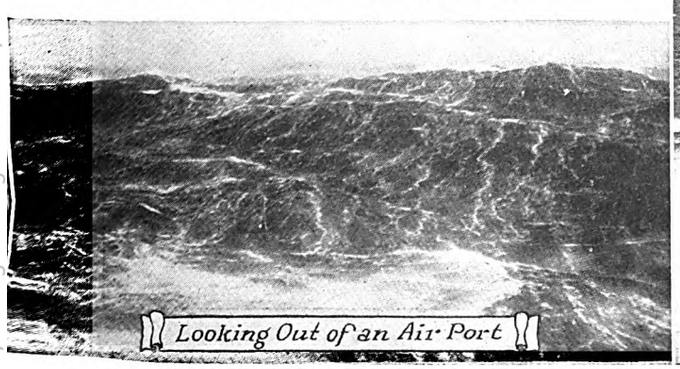
The *America* is also an intermediate ship, somewhat smaller than the *George Washington,* but in general of similar design and type.



How a 75 Mile Gale Looks



"A Heavy Head Sea"



Looking Out of an Air Port

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The *President Roosevelt* and *President Harding* are of the "535-foot" type, the construction of which was commenced during the war, as transports, but altered later to combination passenger and cargo vessels. While not as large as the *George Washington* and *America,* they are somewhat more speedy, have fine accommodations and are good sea boats.

The *President Arthur* and *President Fillmore* are old German vessels, and here again the placing of them in service was due to the lack of other more suitable vessels.

The four *Presidents* running to London are in reality cargo vessels, having limited passenger accommodations. While the quarters on these ships are excellent and the service rendered appears to have called forth nothing but praise, they are not suited to the trade and were only placed on this run as a measure of expediency. They have now been sold and it is understood are to be replaced by ships of the Hog Island transport type carrying cargo only. So far as passenger service is concerned the demand warrants the placing on this line of large intermediate type ships, were any such available.

United States Line Lacks Homogeneity

From this brief description, it at once becomes apparent that the fleet of the United States Lines is almost entirely lacking in the important element of homogeneity and the difficulty of maintaining an evenly balanced service thus greatly magnified. The salient feature is that, notwithstanding the lack of proper tools to work with, the management has succeeded in building up a business good-will of the greatest value and one which should be maintained at all costs, if America is to retain a place of any importance in the Atlantic passenger trade.

By far the larger part of the income of all vessels engaged in this service comes out of the pockets of American citizens. There is now offered an opportunity for the latter to obtain excellent service on their own vessels; and that this opportunity is being taken advantage of is shown by the heavy passenger lists of the American ships as compared with those of foreign lines.

What then are the probabilities of holding and building up this business in the immediate future? The *Leviathan* by herself cannot maintain first class high speed service. At least two other fast vessels are needed by next summer if a well-balanced express service is to be established, and more large ships are needed if German competition is to be successfully met next year. The line to London does not appear of quite the same importance as the others; but there seems little doubt of its success if proper vessels can be provided.

New American Liners Needed

Undoubtedly, the ultimate end to be sought is the construction of new American vessels for all of these services. With operating conditions as at present, it seems out of the question for private companies to undertake the construction of Atlantic liners and, even if Congress should decide to pursue this course, it would be a matter of at least two years before the new vessels could be placed in commission. It remains then to make use of such ships as are at present available if the business is to be held in the immediate future. The *Republic,* now being reconditioned at Newport News, is a fine ship but lacking in the important element of speed.

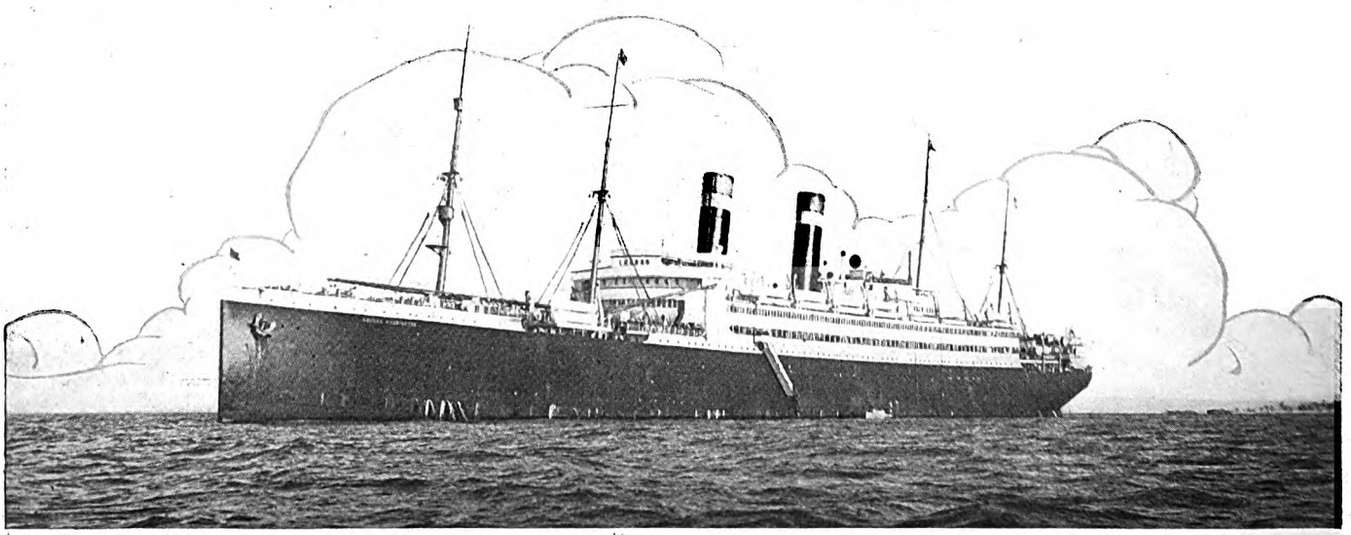
Agamemnon and Mount Vernon Should Be Reconditioned

It seems of utmost importance immediately to build up the high speed service. Apparently the only way to accomplish this in time for next year's business is to recondition the *Mount Vernon* and *Agamemnon.* These two fine vessels have unexcelled records in the Atlantic passenger service, and their potential value cannot be neglected. Their hulls and propelling machinery are in fair condition, and it is believed that passenger accommodations, similar in character to those on the *George Washington,* could be constructed at a relatively moderate cost.

Of course the advisability of reconditioning depends upon its cost. If it were absolutely necessary to carry out the rather radical changes which have been proposed and which would involve an expenditure of approximately $8,000,000 on each vessel, the universal opinion is that the ships are too old to warrant any such outlay. On the other hand, if they can be put in commission at a cost of not over $3,500,000 each, and it is believed that this is quite possible, the growing business and national importance of the line would appear to amply justify this course.

Whatever decision is finally arrived at regarding the use of these vessels, they should not be disposed of to foreigners. If they are sold to foreign account, their appearance by next year as our competitors for Atlantic passenger trade is practically certain.

America has already established a service second to none in efficiency and popularity, limited only by the number and type of the ships in operation. The means are at hand for increasing and perfecting this service, and we believe it to be the will of a steadily growing body of her citizens that this should be done and that America should retain her place in the transatlantic passenger trade.



Steamship George Washington of the United States Line

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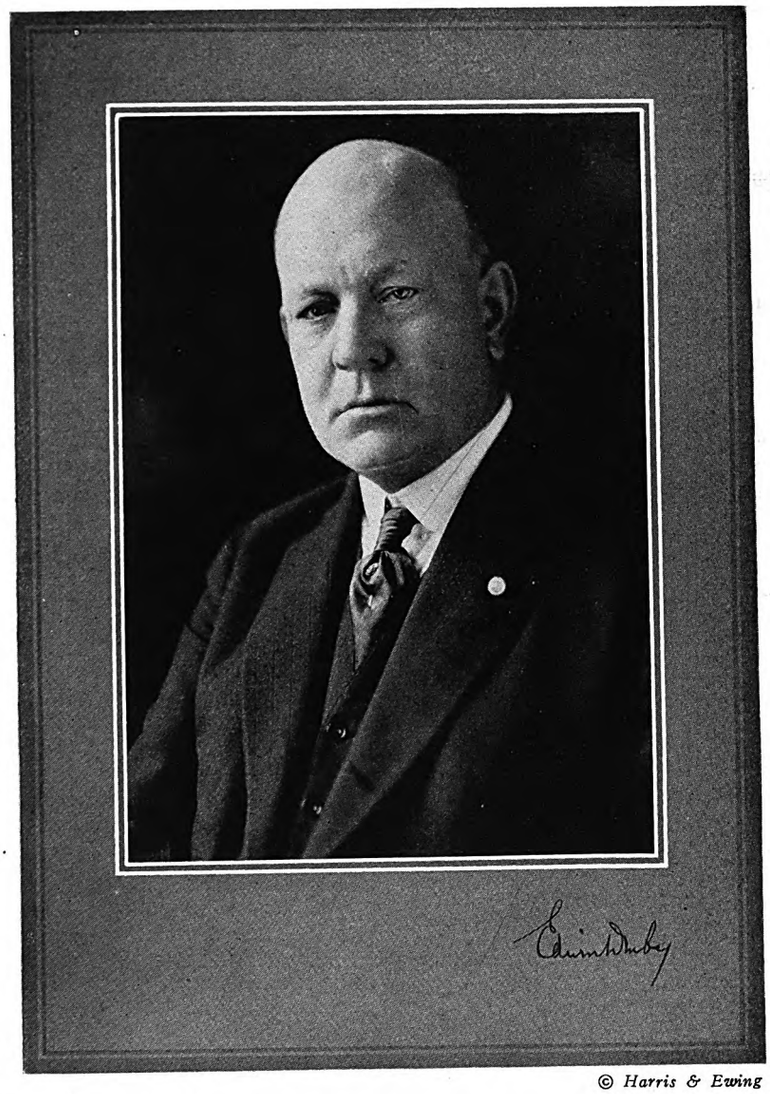
The Navy and Merchant Marine Are Interdependent

Both Must Be Maintained for the Safety and Prosperity of the Country—Large, Fast Passenger Vessels Our Greatest Need

By Edwin Denby
Secretary of the United States Navy

IF we are to maintain the American standard of living as it exists in our country today, we must have foreign trade. If we are not to pay toll to foreign shipping and have our foreign trade at the mercy of competitors, we must have a fair share of our foreign trade carried by our own merchant marine. If we are to be a great power, truly independent and free from commercial subserviency, we need a great merchant marine to carry on our commerce.

All great maritime nations have made provisions, in some way, for taking merchant shipping into the naval service in time of war. This has taken the form of subsidies or subventions, direct or indirect, discriminating rates to further the growth of the merchant marine, etc. At least the merchant ships can be listed and classified and plans made for their transfer to the Navy.



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When war comes and the entire military strength of the nation is to be exerted, the Navy must draw vessels from the merchant marine for navy use—cruisers, transports, fuel ships, repair ships, distilling ships, hospital ships, mine layers, mine sweepers, patrol ships, destroyer tenders, submarine tenders, aircraft tenders, tugs and supply ships of all kinds. In addition, the merchant marine must continue the transportation of articles of commerce essential to the welfare of the people as a whole. When we organize for war, the Navy and the merchant marine become practically one service administratively. During the world war, 95 percent of our merchant shipping was under Government control, particularly as to cargoes and routes.

In 1898 we armed the few large passenger liners we had for distant scouting and general cruiser service. They did what they could, but due to the lack of numbers Cervera's fleet cruised at liberty in the West Indies, and was discovered only after it had been in Santiago for some time. This with a war at our very doorstep and against a power that was even worse off than we were.

In the employment of converted merchant ships as cruisers, many conditions may arise. Our Navy may be employed in protecting trade routes used by our merchant marine; it may be engaged in raiding the sea lanes used by the enemy or denying him the use of them. Its operations may or may not lead to fleet actions. Our merchant marine may be carrying on foreign trade or it may be shut up in port. In any case, the Navy will be short of regular cruisers and the converted merchantmen must fill the deficiency. As the regular Navy is reduced the importance of the converted merchantmen increases. A large merchantman, converted to a fighting ship, may carry a battery formidable for a cruiser and have a great fuel endurance, and, if there are no regular cruisers available for operations in a particular theatre, the converted merchantman becomes of prime importance there. Our greatest need would be for large fast passenger vessels for use as transports, scouts, armed cruisers and seaplane carriers. In this class the United States is very deficient, having only four such vessels of over 20 knots.

As an addition to naval strength, the personnel of the merchant marine—a body of men with the sea habit—is a naval asset, whether in war it be employed on regular naval vessels, on merchant vessels converted to naval use, or on merchant shipping for naval or merchant service. When we entered the world war, our battle fleet had to devote itself to the training of raw recruits in the most elementary duties of the seamen, because we had no merchant reserve to call upon.

The Navy can never be considered adequate to fulfill its mission until it has the backing of a good merchant marine, but a good merchant marine is a poor investment without the protection of a good Navy. In peace and in war the two are interdependent. In my opinion the safety and prosperity of the country demand that we maintain both.

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A Merchant Marine Is Necessary for National Defense*

The Navy, Our First Line of Defense, Especially Needs the Support of a Strong Fleet of Merchant Ships

By Rear Admiral Charles P. Plunkett, U. S. N.**

EARLY in the history of our country the question came up of providing for a purely American merchant marine. That question has been agitated every year since then. It has taken every conceivable form that you could think of and the whole reason for all these variations, knowing what they want to accomplish, is the fact that we have been up against opposition, the opposition of the older nations of the world, and that opposition today is just as strong as it ever was.

I remember very clearly being present on the floor of the House of Representatives as a spectator when President Wilson read his war message to Congress and I couldn't help but think as the words fell from his lips that all this trouble came from one thing and that was the fact that we were not sufficiently strong on the sea to prevent any nation questioning our rights there.

We don't want to control the seas of the world. All we want is equality—equality in quantity, equality in justice, equality in opportunity.

I was present last year, when our late, lamented President read his message to Congress on the merchant marine. It is amazing that Congress could have adjourned without giving affirmative action after hearing what that great man said and the facts which he produced which were absolutely indisputable. But they did. The House passed the bill but it fell by the wayside at the other end of the Capitol and we are today in the same position that we have been in for over one hundred and thirty years.

> **Since the beginning of our Government the question of a national merchant marine has been an urgent and prominent one. The subject was dealt with at the first Congress ever held—that of 1789—and men who organized this nation had the foresight to consider problems that would have far-reaching effects long in the future. So well were these settled that little or nothing has since been found necessary to improve upon them. The foresight of our forefathers has apparently been lost, for the merchant marine which they considered essential to national prosperity is equally necessary today not only for our mercantile welfare but to a greater extent as a first line of support to our naval and military resources in times of war, yet action is being delayed that would firmly establish American shipping in its rightful place on the seas.**

Don't think for one minute that because you built a few ships during the war and you have a Shipping Board, a government organization for ascertaining information and for operation of those ships, you have a merchant marine. I don't know why I should make that comment, because every one of you knows that the thing that carried through this war was the people and not the material.

Now, there is our situation. We can go on building ships until the end of time, but if we don't create the people to operate them and run them and create all of the facilities connected with the operation of them, to the far ends of the earth, we will never accomplish what we are after.

Position of American Ships in Foreign Trade

Today our exports in American bottoms are about 38 percent of what is shipped out of the country. Our imports are about 32 percent in American bottoms. The Congress has declared that it is the policy of the American people that it shall be at least 50 percent. What is the good of declaring a policy if it is not carried out? Our trouble is that we are forever declaring policies but only going into them half-heartedly. We have all these various policies and here and there are men working with their coats off to carry them out but we don't get the support for it that we ought to have.

We have leaders. We have intelligence. We have money—everything that is needed to put this merchant marine on the high seas and operate it, so that the farmers who are crying now about the price of wheat will not be bothered about their market. They are only one of the many who need this merchant marine. There is absolutely no reason in the world why we should not have it.

The Merchant Marine and National Defense

Now, we talk about national defense. Why, the strongest argument that President Harding brought out for the merchant marine was the fact that it was an essential part of any scheme for national defense, that we could not be fully prepared unless we had a merchant marine. I can assure you that it is a pipe dream to take the naval fleets of America seven thousand miles across the Pacific without an American merchant marine.

In order to do anything in this country of ours it has to take the form of a movement. It must be labeled and spread on the headlines of the press. That isn't 100 percent Americanism. The people are just not thinking 100 percent American. Your country expects that when you have spare moments, you will think about America and what is going to make America first, not something else, but first. And we can't be first unless we have a merchant marine.

Former Position of Germany on the Seas

Now, if you will take the time to read Admiral Mahan's splendid book on the "Influence of Sea Power on History"—every word of which is founded on fact—you will see why it is that things are as they are all over the world and how impossible it is to say to all the different tribes that existed in the past and exist today that each and every one of them shall be a separate and independent nation determined by themselves. Germany had no navy to speak of until the Kaiser read that book of Admiral Mahan's. Say what you please about the man, he realized that Germany could never

* From a speech made at the national convention of the New York State Department of the American Legion, Saratoga Springs, New York, September 13, 1923.

** Commandant of the Third Naval District, New York Navy Yard, Brooklyn, N. Y.

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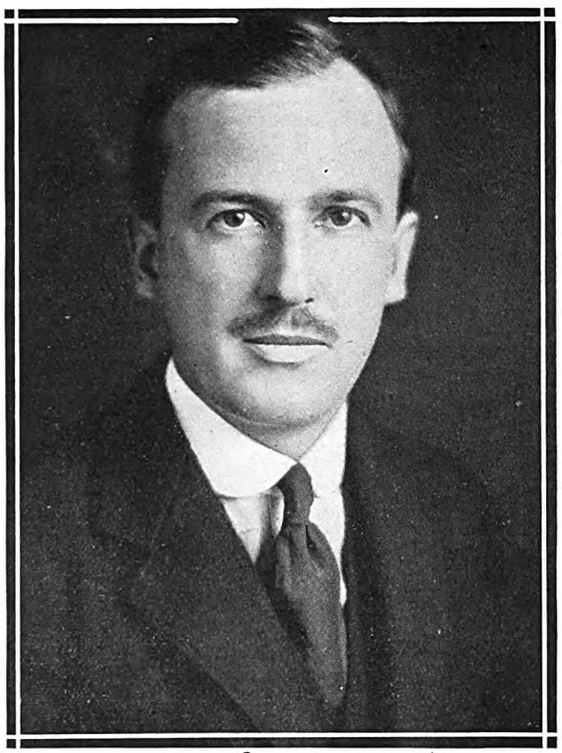
Shipping Board to Readjust Methods of Handling Its Fleet; Existing Routes to Be Consolidated

Essential Lines Will Be Gradually Extended and Transferred to Private Owners as Soon as Purchasers Can Be Found—Regular Sailings at Fair Rates To Be Maintained

By Edward P. Farley
Chairman, United States Shipping Board



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THE Shipping Board's immediate problem is the operation of essential trade routes with the least possible drain on the national treasury. These trade routes should be gradually built up by efficient service and by extending our freight connections and creating a good will which will result in shippers sending their goods over our lines.

With the depressing effect of European conditions on world shipping, it must be expected that there will be but small profit in the operation of the most economical tonnage. Our own tonnage, necessarily more expensive, must be expected to show a loss in operation. During the period in which these losses are to be anticipated, the greatest possibility of economies lie in the consolidation of routes so as to carry the cargo offered with the fewest possible ships. This is the immediate aim of the Shipping Board in the consolidations being worked out, and in making them the board is creating that flexibility of movement which is essential to successful operation of shipping.

With the consolidation of routes, we will eliminate the ships now operating in excess of the number needed to carry the tonnage offered, while maintaining reasonable regularity of sailings. We will then have arrived at what may be considered bed rock conditions from which a gradual enlargement of the fleet can be anticipated as confidence grows in the services established and as international trade conditions improve. It is the intention of the Shipping Board, so long as it is operating any of the essential trade routes, to put on whatever additional tonnage the business conditions warrant and to maintain on the routes fair and reasonable rates.

In connection with rates it should be borne in mind that it is of no permanent advantage to shippers, to develop or permit a condition to exist where their goods are carried at less than cost, including a fair return on invested capital. If any business is being conducted at a loss, it is but a question of time before a readjustment must be made in which, through the elimination of competition, new and higher prices are set up to the disadvantage of those dependent on that business.

We can perhaps say, therefore, that our immediate problem is the readjustment of the methods of handling the fleet, so that the business obtainable on essential trade routes can be carried with the smallest possible loss. Then we must turn to the gradual building up and extension of these lines through the service afforded, and provide for their transfer to private hands as soon as purchasers can be found. These purchasers will appear when, through improved operations or changed shipping conditions, there is a possibility of profit in operation, and not before this time.

There is a differential against the American ship operator as compared with operators under foreign flags. There may be a difference of opinion as to the amount of this but it is a matter of national importance and we can confidently rely on Congress to enact specific legislation when its character and extent are clearly made known.

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take her position among the nations of the world until she had a navy and a merchant marine.

With all due respect to everything else that has been said on this subject, we can thank God that the war came in 1914 and not in 1921 when the German fleet would have been completed.

Here we are today, the inventors of aviation, the inventors of the submarine, and where are we? We are way down at the bottom. We start things but we don't get anywhere. The only thing in my recollection that we have put over in first class style was the world war and we had to do that or we would have been wiped off the face of the earth. That is the only thing that put our strength behind that war, the fact that we knew what we were up against and were determined to fight it out.

We have always talked defense. But you can't be strong defensively, you can't keep up the morale, unless you instill into the people who are carrying on, the idea that some day they may have to fight. It is ridiculous to try and support anything of the kind on any other basis.

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Plan Proposed by the United States Ship Operators' Association for Operation of Government Tonnage

AT the joint hearing held in Washington by the United States Shipping Board on August 28, 1923, a plan for the operation of Government vessels was submitted by the United States Ship Operators' Association.

The following abstract gives an idea of the general intent and scope of this proposal:

The purpose of the plan is to put on the operator or agent a greater measure of responsibility than at present, so that, if the present losses increase, the agent will bear a substantial share of such increase; whereas, if they diminish, he will receive some of the resulting benefit. With these ends in view, the plan provides for the fixing in each service of a standard voyage figure based on operations for a number of months to be agreed upon. If the agent does not do better than the standard figure, he will get no compensation for operating and will receive only a husbanding fee. If the agent falls below the standard voyage figure, he will be obliged to bear an agreed upon percentage of such deficit. If his operation shows a surplus above the standard figure, he will receive a percentage of such surplus and the remainder will go to the Shipping Board, but of this remainder a certain part is to be put into a purchase and building fund

Consolidation of Routes

The association agrees in principle to a consolidation of trade routes for the purpose of limiting competition between vessels of common ownership, but suggests further discussion along this line.

Each agent, when undertaking operation, must have tangible net assets of an amount to be later determined for each vessel that he undertakes to operate.

Vessels shall be allocated by the Shipping Board to agents to be operated by them as the board's agents on different trade routes, the agents guaranteeing maintenance of these routes for a definite period.

Vessels shall be delivered to the agent in good condition, fully equipped to 100 A-1 class and shall be so maintained; ordinary repairs and replacements chargeable to voyage account; expenses of reclassification, of maintaining class and of major repairs, also any losses arising from inherent defects and replacement of gears and pinions in turbine vessels to be for the board's account.

Premiums and assessments for P. and T. insurance shall be charged to voyage account, but at rates not higher than the market. Insurance against fire and marine risks, including collision liability, shall be maintained by the board for its account, fully covering all concerned. In case of insured losses, the board shall make any advance of funds necessary pending collection of insurance. Liabilities for collision, personal injury, cargo damage, and other liabilities of an accidental nature are to be assumed by the board.

All expenses arising from a loss of time in excess of 24 hours and due to accident to vessel or cargo shall be borne by the board.

An audit shall be made covering an agreed period on each trade route for the purpose of fixing for that route the net result per voyage for such period. This audit shall take account of all revenue and disbursements arising from operation, but shall not include ship insurance, depreciation or interest.

Division of Profits and Losses

The agent shall collect all earnings and pay all operating expenses, except as otherwise stated in this instrument. At the conclusion of each voyage, he shall render an account to the board, showing the results as compared with the standard figure. The surplus or deficit thus determined shall be divided between the board and the agent. The agent shall receive no compensations for operating other than that above provided for.

Purchase and Building Fund

A certain percentage of any surplus paid to the board under the provisions of the preceding paragraph shall be deposited in a bank or trust company in the joint names of the board and the agent as a "Special Purchase and Building Account." At any time during the life of this agreement, this fund may, at the election of the agent, be devoted to any or all of the following purposes:

(a) Making good the operator's losses on voyages during the term of the agreement.
(b) Converting any vessels covered by this agreement into Diesel engine vessels.
(c) Purchase of tonnage from the board.
(d) Building new American tonnage for the agent's account.

If the agent does not use this fund for any of the purposes set forth, during the term of the agreement, his rights therein shall cease, except that he may apply it to build new American tonnage contracted for within a stated time after the termination or cancellation of the agreement.

Husbanding Fee

The board shall pay to the agent an agreed sum per vessel per month which shall be debited against the voyage account.

All agent's disbursements charged to the voyage account shall be net, and he shall derive no direct or indirect profit therefrom. Where the agent provides terminal facilities, rates and terms for their use shall be agreed upon between the agent and the board.

The agent shall have control of operations, including decisions as to rates of freight, conferences, sailing dates and personnel. He shall also supervise all ordinary repairs and replacements. He is to have the benefit of all information possessed by the board relative to the vessels and trade routes in question.

The board will not allow interference or competition on the routes covered by the agreement by any other Shipping Board tonnage nor by any vessels purchased from the board at less than full world market rates.

The board agrees to substitute for vessels which may be a total constructive loss or which have to undergo major repairs, other vessels of similar size, type and condition.

In order to provide for proper maintenance of service, and seasonal movement of cargo, the number of vessels in each trade shall be increased or decreased as traffic requires, the board agreeing, at the agent's request, to supply additional vessels or lay-up surplus ones. Vessels while so laid up shall be for the board's account and risk.

If the agent shall have been found by a board of arbitration guilty of wilful violation of this agreement, or of inefficient management, the board may cancel the agreement on 30 days' notice. The agent may cancel the agreement on 30 days' notice, if he has sustained operating losses exceeding the sum in the "Special Purchase and Building Fund" by an agreed amount per vessel operated.

The above abstracts cover the main points of the operators' plan and proposed operating agreement. Some modifications were submitted to the Shipping Board on September 13, 1923, but the proposal remains substantially as here outlined.

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Shipping Legislation That We Have and That We Need

Laws Now on Our Statute Books That Would Greatly Benefit American Shipping, If Enforced—New Legislation Needed

By "Old Scotch"

BEFORE embarking on a new campaign for the American merchant marine, or for any other enterprise, it is always well to take stock of our assets as well as our needs to accomplish the end for which we seek.

The forthcoming American Marine Congress is called largely to discuss our needs for the future in maintaining a sufficient number of American ships in our foreign trade. The passage of the Jones Bill, otherwise, known as the Merchant Marine Act, 1920, was supposed to provide all necessary legislation for the time being. Circumstances, however, have made that Act, comprehensive as it then was, entirely inadequate to accomplish the policy laid down in its preamble "To do whatever may be necessary to develop and encourage the maintenance of such a merchant marine," that is a fleet of the "best equipped and most suitable types of vessels sufficient to carry the greater portion of our commerce, and serve as a naval or military auxiliary in time of war or national emergency."

This act, approved June 5, 1920, contained much that is valuable for the accomplishment of such a policy, some of which has reached fruition and some of which has progressed no further than the statute book. The principal sections among the latter are as follows:

Section 5. Sale of Vessels

"The Board is authorized and directed to sell, as soon as practicable, consistent with good business methods—all of the vessels—acquired by the Board."

This has been complied with in part, and in justice to the Shipping Board it would seem that they have acted in accordance "with good business methods," when we consider the almost universal collapse of the demands for ship tonnage, due to the terrible falling off in ocean transportation. Sales of a small amount of tonnage of desirable vessels have been made at prices approximately the prevailing world's tonnage values, which have been compatible with the almost negligible demands. No further legislation is needed along these lines, as it is presumed that the Board will take advantage of their authority as conditions change for the better, which at this time seems to be the only way they can change.

Section 11. Construction Loan Fund

"The Board may annually set aside out of the revenues from sales and operations a sum not exceeding $25,000,000 *to be known as its construction loan fund, to be used in aid of the construction of vessels of the best and most efficient type for the establishment and maintenance of service on steamship lines deemed desirable and necessary by the Board—. No aid shall be for a greater sum than two-thirds of the cost of the vessel or vessels to be constructed, etc."*

The setting aside of funds received from operations is more or less of a mirthsome provision, in the light of events subsequent to the passage of the Act, but there have been very substantial receipts from "sales" of ships and property. Singularly enough, so far as is generally known, this provision for aiding "steamship lines" has been resorted to in but one instance, and that was for the New York-Duluth service The Board's legal talent, in approving this loan, was much more progressive than Steamboat Inspection interpretations that laws for "steamships" are not applicable to motor-driven vessels. However, there can be no question but that this section of the Jones Act will be very helpful when the time comes for American shipowners to make investments in needed equipment as water-borne commerce picks up.

It should be noted that this loan fund is not alone applicable to new vessels in the foreign trade, as is evidenced from the fact that the only loan known to be made thus far has been to a line employed in domestic trade. As this legislation is very much akin to the farm-loan provisions of law, and as it can be used much to the advantage of our agricultural interests, as for example the loan made on the motorships which will carry large quantities of grain, butter and eggs from the Northwest to the Atlantic seaports at lower than rail rates, it should and probably will be kept on the statute books.

Section 21. Extension of Coastwise Laws to Insular Possessions

"That from and after February 1, 1922, *the coastwise laws of the United States shall extend to the island territories and possessions of the United States not now covered thereby—."*

This is one of the most valuable of the unenforced provisions of the Jones Act, as the question of the extension of the coastwise laws to the Philippines is herein authorized. However there were certain provisos attached to the section, the principal of which provided that it would not be effective so far as the Philippines are concerned until the President issues a proclamation to *"Declare that an adequate shipping service has been established."*

To the mind of the layman this wording seems to present an almost impossible condition. How in the name of Heaven can any one expect American shipowners to establish "an adequate shipping service" to the Philippines without having some assurance that a proclamation will be issued. Possibly our ignorance of legal phraseology may put a wrong construction on this clause in the existing law, but there is no question in the minds of American owners but that this much desired provision of the Jones Act should be placed in operation at the earliest possible time. The Marine Congress, it is hoped, will add the weight of its influence to bringing this matter to a conclusion.

Passengers on Cargo Vessels

Section 26 *of the Act contains authority to carry not more than* 16 *passengers on any American cargo vessels without being held to be "passenger vessels" or "vessels carrying passengers" within the meaning of the inspection laws.*

This has been taken advantage of in but very few instances, but there is no doubt but that when trade picks up and permanent routes are established, this provision of law will be of decided advantage to American ships. Business people must go where goods are to be sold, and ofttimes there may be no established passenger service to foreign ports where it is desirable to extend our foreign trade.

Through Preferential Rates to be Allowed Only When Property or Passengers Are Carried in American Vessels

Section 28 *of the Jones Act makes it permissible under certain conditions for the Interstate Commerce Commision to give preferential railroad rates on passengers and merchandise arriving in or departing from American ports.*

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This has as yet not been enforced and in the opinion of many experts can be made very advantageous to American ships. It is naturally a very complicated matter, and one in which there can be many conflicting elements. The common carriers on land do not welcome any reduction in rates, which they consider at present to be none too remunerative for the burdens placed upon them by other requirements of law. The whole subject is now being given rapt attention by officials who are interested, and out of their conclusions may yet come some reductions which will benefit shipping.

Discriminating Customs Duties and Tonnage Taxes

Section 34 of the Jones Act was the one most relied upon to furnish the inducement for private owners to operate vessels in the foreign trade. In it the President was "authorized and directed" to serve notices of intent to nullify or amend any treaty with any foreign nation, which conflicted with our right to impose preferential tonnage taxes or import duties on all but American vessels bringing goods to our shores.

Under a similar policy in the early part of the last century, the American merchant marine was fostered until it became very prosperous. A similar result was expected under the terms of the Jones Act. President Wilson and President Harding both considered that under the existing unsettled condition of world affairs it would be unwise and inexpedient to serve such notices, and hence to date it has not been done. This lack of action serves to draw attention to the fact that Congress does not get very far in "directing" our chief executive as to what he shall do in affairs of diplomacy.

Whether President Coolidge will agree to the annulment of these treaties remains to be seen, and perhaps he would be glad to hear the opinion of the Marine Congress on the subject.

Whether the treaties are modified or not has no bearing on the subject of preferential duties in the indirect trade. That is, for example, if American ships and German or English ships are in competition for trade from Brazil to the United States, there is nothing to prevent Congress from giving American ships preference, so far as customs duties are concerned, of a sufficient amount to allow American vessels to compete. Brazilian vessels would, of course, have to be given the same treatment which we accord our own vessels, and which would be eminently proper. As many important export markets of the future are likely to be with countries having little or no shipping of their own, legislation of this kind would be very valuable and should be urged by the Marine Congress, if it is again decided not to apply the principle generally to all nations.

While the above are the main legislative enactments from which benefits may be obtained, if they are invoked, the following are some of the matters needed which have been discussed as of value, and which it is hoped will be enacted into law as soon as possible. They may very well be discussed at the Marine Congress and be the subjects of finite recommendations.

Restrictions of 50 Percent of Immigration to Our Own Ships

This is a much desired piece of legislation for the benefit of American vessels in the North Atlantic routes, as it is from European ports that the great bulk of our immigration comes. The necessary authority was contained in the original subsidy bill, and there was very little opposition to it. There was, however, some friction in the House of Representatives, as to whether or not the Committee on Merchant Marine and Fisheries, which handled the subsidy bill, should have jurisdiction over this particular item, where there was a perfectly good Committee on Immigration which claimed all such matters.

No matter how it is handled in Congress, it is of such an equitable character that it should be passed in the new Congress, as one of the costless means of benefiting our merchant marine in foreign ports.

Government Employees Must Travel on American Ships

This clause was also included in the subsidy bill, and of all the many items in that ill-fated measure, it was the only one to which there was given unanimous approval. In itself it will bring no appreciable revenue to American ships, but psychologically it will be of great advantage. The example set by many high officials of the diplomatic and consular service in traveling to and from their foreign stations on alien vessels, when, as has frequently occurred, they could have traveled on ships flying their own flag, has been, to say the least, abominable. The examples they have set have had a very damaging effect on the action of American citizens, who have given foreign vessels preference in traveling abroad.

During the past summer and spring there have been an unusual number of United States senators and congressmen who have gone to Europe to study conditions over there, and to their everlasting credit, almost without exception they have selected American vessels on which to make their pilgrimages, and paid for the passages out of their own pockets. There is therefore very little doubt but that legislation will be enacted at the next session of Congress, making it mandatory for those who travel abroad at public expense to patronize American vessels wherever possible.

Revision of Navigation Laws

This subject is one of great importance to the successful operation of our merchant marine. Many tomes have been written on the subject, and much oratorical effort expended. Many ill-advised proponents of shipping have contended that such revision was all that we need to place our ships on the seas and keep them there. As a matter of fact, if we adopted the Merchant Shipping Act of Great Britain in toto, we would come very far from meeting success in the rivalry on the ocean; while there are certain phases of the English shipping laws which are not at all applicable to our ship operation, the present navigation laws and Steamboat Inspection Regulations should be so amended that American vessels will have no more restrictions than British vessels.

These laws and regulations have been in process of revision by Shipping Board experts for many months, and the authorities at Washington should be urged by the Marine Congress to have the revised draft submitted for action by our lawmakers as early as humanly possible.

As a general rule the less laws and regulations we have the better it will be for all concerned. The classification society should be depended upon for much of the onerous and time-consuming inspections now demanded by our Government. American vessels have more inspections than the vessels of any other nation. This not alone is provocative of delays, but in the end much money is wasted in the annual inspections of cargo vessels.

Naval Reserve

It has been suggested that one way to overcome the differential in cost of crews on American vessels engaged in the foreign trade is to detail enlisted men from the authorized personnel of the Navy to man these ships under merchant officers. In view of the value of the training they receive in the operation of merchant vessels, a duty they would have to perform in time of war anyhow, it is proposed that one-half their pay be given from the naval appropriation, and the other half to be paid by the shipowners. This would effectually overcome the difference in wage costs and provide real patriotic American crews—so much needed for an efficient merchant marine engaged in the foreign trade.

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How Our Navigation Laws Handicap American Ships

Codification and Revision of Marine Laws Has Received Wide Endorsement—Recommendations Filed by Special Committee on March 5, 1920, Should Be Given Consideration

By V. G. Iden

IT is generally conceded by all students of shipping that one of the fundamental handicaps under which the American merchant marine operates is found in the sundry federal laws which have been enacted to regulate shipping. In a democratic country such as the United States it has been comparatively easy for first one and then another political group to have an act put through Congress. Some of these have been "log-rolled" and some have been put through on a "trade." Politics is a tricky master and many a well-meaning idealist has found it necessary to compromise in order to accomplish even a little of what he thought was good.

Furthermore political complexion has first taken on one turn and then another. Colonial restrictions enacted by European powers resulted in counter acts by the United States. Graft resulting from the mistaken forms of state aid granted after the Civil War brought about a reaction and a counter of restriction. The sinking of the *Titanic* caused a hysteria that resulted in further restrictions on the building and equipment of ships. Then labor obtained the ear of Congress and the La Follette law was enacted.

All comes down to the one thing: That the navigation laws of the United States have, for the greater part, been the result of outside influences rather than from any urging within the ranks of merchant shipping. Little of such laws was intended to encourage American shipping, but mostly the laws were designed to prevent American shipowners from doing some specific thing. The imposition of restrictions is always a burden, no matter whether they are warranted by humanitarian motives or not.

War Caused America To Act

It was not until the Great War with Germany occurred that the United States awoke to the necessity of doing something and of doing it in a hurry. Naturally within such a brief space of time available it was impossible to undo all the statutes that had blighted American shipping during the previous decade. That method of recouping our maritime power was not to be thought of, so it was decided to enact the United States Shipping Board law. That law created a body which was supposed to study the shipping problem and to draft regulations and recommend to Congress new laws to aid in the upbuilding of our marine. By attaching the shipbuilding provisions to that law, which were necessitated as a war emergency, the issue was complicated.

Ever since that time the intent of the original Shipping Board Act has been clouded by government ownership and the urgency of getting some tangible good out of the fleet. A subsidy was proposed in order to encourage private operators to take over the fleet, but Congress refused to enact it. With the closing of that issue the atmosphere is once more being cleared and the time is now ripe to bring back to the attention of the public the fundamental handicaps on the private operation of merchant ships found in the navigation laws.

Committee to Study Navigation Laws Authorized

On September 4, 1919, the United States Shipping Board adopted a resolution authorizing the creation of a body of practical shipping men to study the subject of our navigation laws and to report thereon to the board. The committee was subsequently created with this personnel: P. A. S. Franklin, chairman, J. Parker Kirlin, Homer L. Ferguson, H. F. Alexander, David T. Warden, Alfred Gilbert Smith, Eugene E. O'Donnell, Andrew Furuseth, William S. Brown, Darrah de Lancey, and A. N. McGray, all men well known in the shipping industry. This committee filed its report with the board on March 5, 1920. While the report of the committee was never made public it is generally acknowledged that parts of its recommendations were incorporated in chapters which were primarily compiled and proposed to Congress for the new navigation code. Inasmuch as no comprehensive codification and revision of these laws has as yet been approached, a survey of the findings of this special committee remains the best measure of the shortcomings of the existing laws.

The present navigation laws and the regulations thereunder are to be found scattered through a large number of volumes of statutes and regulations, passed at different times. Numerous amendments have been made which repeal all acts and parts of acts inconsistent therewith. This forces a comparative study of the various statutes and regulations, if it is to be determined just what the present law or regulation on any particular subject is.

A technical committee, it has been suggested, should be authorized to draft a consolidation of the revision of the laws into a single code. It has further been suggested that the authority to make regulations under such a projected code should be vested in a single administrative body, or department of the Government. At present the authority to issue regulations under laws on merchant shipping is scattered among a number of boards and bureaus.

The reasonableness of these demands is readily apparent and in principle has been endorsed by the Government. It remains to see that the codification is made and enacted by Congress. And if the proper amendments are enacted in that code the American merchant marine, in the matter of protective law and regulation, should be placed upon a parity with the merchant ships of other maritime nations of the world.

Recommendations of the Special Committee

Further recommendations made by the special committee relate to the enactment of a load-line law; the adoption of a resolution calling for an international conference to draft rules for the prevention of collision at sea, and the approval of the Brussels treaty dealing with the subject of liability for collisions. While these subjects are but concomitant, they nevertheless have a bearing upon the main subject and their adoption would tend to make the United States a leader in things maritime. It must also be recognized that the committee making these recommendations was one composed of representatives of labor, shipowners, operators, shippers. They represented all different business complexions. The recommendations are non-partisan and were made in the best interest of the great industry of merchant shipping under the American flag. Under such circumstances it is difficult to understand why the United States Shipping Board would hesitate for a moment in passing the recom-

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mendations on to Congress and Congress halting for a moment in executing them into law.

Commerce by water is a problem which does not necessarily embrace that of a merchant marine. Water commerce depends upon the encouragement that a particular locality gives to ships to enter and clear the port. Port regulations imposed in the form of harbor dues, tonnage taxes, lighterage, dock rentals, pilotage, customs inspection, health regulations, go to make up the popularity or unpopularity of a port. Ships will naturally seek out those ports through which they can clear their passengers and cargoes with the least expense and with the greatest expedition. Those ports have the greatest steamship services no matter what flag predominates on the high seas.

It is this fact which explains to some extent why certain ports of the United States appear to be favored over others in the way of steamship connections. The fact that some ports have, in the past, been given what was thought inadequate steamship services prompted appeals for Government assistance. The United States Shipping Board, being a Government body, was naturally responsive to political importuning, and services were established out of ports which would not otherwise have boasted of a marine.

Economy of Operation and National Protection Determining Factors

But port services and a marine flying the American flag are two entirely different things. The ocean is free and trackless, except to the extent to which custom has evolved certain general trade routes. These routes have been predicated upon the place from which commerce originated and the destination to which it was going as well as upon the availability of ports through which that commerce flowed. The flag which ships fly is primarily determined by the economies of operation and the national protection permissible under that flag. American capital has invested freely in vessels flying the flag of nations other than the United States, and will continue so to invest until the navigation laws of this country are revised and codified so that all artificial restrictions are removed and our ships are given as much freedom of action under the laws as are the vessels of other nations.

If it is the popular desire to have American money invested in ships which fly the American flag, then it should be the popular desire to have statutes which encourage such investments. Liberalizations of the laws are essential, and it has been shown that such liberalization is possible without in the least destroying the safeguards to the public which our laws should be solely concerned with. A detailed study of the existing laws will show how wide of the mark they have gone.

Tonnage Measurement Rules

Rules of admeasurement are issued by executive action under the statutes. These rules are drafted by the Commissioner of Navigation and applied by him in the manner in which he decrees the law directs him. Until the World War the rules so promulgated seriously discriminated against American ships inasmuch as certain spaces were included in the total tonnage of a ship which were not included under the admeasurement rules of other nations. It was claimed that the American tonnage was approximately five percent larger than would be the tonnage had the ship been measured under the British flag, and was even larger in comparison with German admeasurement. This meant that port fees and other taxes which are based upon the tonnage of a ship were larger in the case of American vessels than in the case of vessels flying the flag of another nation.

In respect to admeasurement, however, the correction was comparatively simple. The excutive rules were changed in 1915, after the outbreak of war so patently brought to the attention of Washington officials the necessity of considering the claims of steamship owners with more grace. Our rules now permit the exception of certain spaces subject to certain construction provisions which are clearly set forth in the existing rules. It now appears that builders in the United States are taking advantage of the opportunities offered for deductions, thus giving American ships substantially the same advantages that are enjoyed by vessels of other nations.

In 1919 the Commissioner of Navigation issued a ruling that all double-bottom spaces may be eliminated from or not considered at all in the calculations of the gross tonnage of ships. It has also been pointed out by practical naval architects that Articles 39 and 40 of the commissioner's regulations clearly provide for the deduction of propelling machinery spaces and for the addition of certain air and light spaces which entitle the vessels to a deduction of 32 percent of the entire gross tonnage. It has been recommended that the attention of owners and builders be drawn to these provisions in order that, by taking advantage of the new regulations in the preliminary designs of the ships, they may be allowed deductions which will materially reduce the net tonnage and will practically put ships under the American flag on a par with those of other maritime nations.

It would appear from these simple examples drawn from the more modern interpretations given our navigation laws that some of the serious inequalities have been removed. But it will be observed by reference to the rules that if the propelling machinery spaces are not larger than absolutely necessary for certain types of machinery now being installed, the question arises whether or no they should be made larger by increasing the light and air spaces without encroaching on the cargo spaces. In the case of bulk ships this would make a material difference in freight earnings, due to the extra cubic capacity, whereas in deadweight ships the loss in cargo space would be negligible.

Measurement Complicated by Dual Control

The law specifies that the measurement of vessels shall be done by the surveyors of customs, and further directs that the Commissioner of Navigation shall have supervision of the laws relating to the measurement. Here we have two executive departments of the Government concerned with the one thing, a situation which is always conducive to complication and inconvenience. Common sense dictates that both the "personnel" as well as the "supervision" in this case should be under the Commissioner of Navigation alone. It has furthermore been suggested with good logic that the country should be divided into "admeasurement districts" under separate supervisors, directed through one central office.

According to shipping men a load line law is especially desirable. In consultation with leading naval architects, shipowners and operators and others concerned, a model act has been proposed which has already been before Congress. This, it is felt, should be incorporated in the statutes.

It would appear that the shipping world is not averse entirely to regulation by Federal authority, although it is averse to regulations which are based upon antiquated needs and directed by statutes which should be killed by Congressional action inasmuch as they are already dead through modern usage. The law, for instance, directs that there shall be an annual hydrostatic test of marine boilers. This means that the boilers of steamships shall be subjected to a specially extra hard strain each twelve months. It would be much better to accept a test made under scientific conditions at the factory when the boiler is built and provision be made for the acceptance of a report from the classification society at the periods of survey. In case a vessel is not classed by a recognized classification society, the survey period should not exceed three years, at the end of which time the application of the hydrostatic pressure should be made if in the dis-

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cretion of the surveyor or inspector this application is found necessary. A dry examination could be made yearly or oftener, if thought advisable.

Likewise the steam-pipes and boiler auxiliaries could be tested at the plant or when installed on board the vessel. A modification of the regulations in this way would be of great assistance to American ships and would, in a manner, be a step tending to cooperate with, instead of to hamper, American steamship operations. This revision would remove any possibility of prosecution under the law. Shipping men are not so narrow as to show hostility to all regulation but they want that regulation so applied as not to penalize their operations. For instance the law requires the use of fusible plugs on marine boilers. These entail an added expense but are demanded in the name of safety. Steamship owners are not opposed to this but they do criticise the numerous and perplexing regulations issued on the subject of such plugs.

No Discretion Allowed Inspection Service

The spirit which prompted the enactment of many of the navigation statutes of the United States was such as to evidence an inherent hostility toward shipping. That is undoubtedly why so much criticism is heard of the mandatory character of the legislation under which the Steamboat Inspection Service operates. That is also why no discretion is left to the officers responsibile for the enforcement of the laws. British law permits elasticity as does the maritime law of most any other nation.

Our merchant fleet is composed of many diversified types of vessels engaged in various kinds of navigation. It is difficult to draft any mandatory type of law for general application under these circumstances. The earlier laws, which still remain a part of the statutes, related to vessels operating on inland waterways. And many of the statutes, while somewhat more modern in their intent, still could not be amended satisfactorily to cover the various types of vessels which developed from the early steamboat and which now make up our diversified merchant marine.

In the revision or recodification of the statutes, therefore the request of the steamship men that this basic fact be kept in mind appears to be wholly reasonable. They request:

First: That all steam or motor propelled vessels be classified, having regard to the particular types and trade conditions.

Second: That the laws governing classification and inspection be revised, having regard to the particular types and trade conditions.

Third: That the revised legislation give to the administrative office discretionary authority without sacrificing safety.

Fourth: That all seagoing, lake, bay and sound vessels of more than 200 tons be built under the rules and survey of the American Bureau of Shipping or similar classification society.

Fifth: In the division of vessels into groups, the rules of the Board of Supervising Inspectors and the American Bureau of Shipping will be helpful in defining the various types. As the laws governing the Steamboat Inspection Service principally cover safety of life at sea, some of the present statutes may reasonably apply to all types; in the main, however, specific statutes covering each particular group will be found desirable.

Suggested That Classification Societies Make Surveys

It has been suggested that cargo vessels should be subjected to inspection at the survey periods by the classification societies abolishing the annual inspection by the Steamboat Inspection Service, which would place our laws upon a parity with those of England in this regard. At least a survey every eighteen months would appear to be adequate. All repairs and structural changes could be referred to the classification society for action at the survey period, or if considerable deterioration has actually taken place in the vessel's hull, boilers or machinery, prompt action could be taken if deemed advisable by the classification society. Passenger vessels could be subjected to an annual inspection, but the application of the hydrostatic pressure to boilers should only be done at the survey periods and all questions of reconstruction should be passed upon by the classification society.

The imposition of so much authority in the classification societies is wholly warranted by the developments of recent years. These societies have a reputation at stake and are believed in many high quarters to be more responsible than any group of inspectors which the Government may put out by political appointment. "The time has come," said a memorial to Washington signed by the leading American shipping men, "when we might give formal recognition to the functions of the classification societies and in our opinion the closest harmony and thorough cooperation should exist between the inspection service and such societies, to the end that a successful, vigorous and efficient merchant marine may be developed." In that thought responsible trade authorities agree. The insurance companies will place their risks upon the reports of such societies and the Federal authorities might as well profit from such a practical endorsement.

A revision of the statutes made in this spirit would be of great assistance to the American merchant marine. It would be an encouragement to private ownership and operation instead of a discouragement. Furthermore these recommendations, which have so long been pending before the Shipping Board, have not only the endorsement of the American owners but likewise the endorsement of the representatives of labor.

The revisions suggested would not relieve the steamship owners of their responsibility to maintain the structural features of ships to a point that is entirely adequate for all purposes of safety. The revisions would merely relieve them of arbitrary rulings which place them at a disadvantage in comparison with the merchant ships of other nationalities, and would limit the application of such laws to times when it would interfere least with the business of the ship.

Laws Relating to Manning of Vessels

But a codification of the navigation laws should not be limited only to questions of admeasurement and survey, but should also embrace all the laws which have to do with the manning of ships. Our laws relating to personnel aboard ship are such as to conspire against the competency of American officers instead of jealously guarding such competency. It speaks well for the rank and file of American sea officers that they have maintained the morale and high standing they actually enjoy in the face of such conditions, when, as a matter of fact, it would be comparatively easy for incompetents to receive high rating under our method of examining applicants and of granting licenses.

It has been recommended that the laws be amended so as to impose in the Board of Supervising Inspectors the power to make rules for the examination of applicants, to determine the class and character of licenses, and formulate uniform examination papers for the use of the local inspectors who shall examine the applicants on such papers. The supervising inspectors should also have the power to revise or alter the examination papers as time and conditions may make advisable.

Under the present law applicants for licenses are examined by the local inspectors of the several districts. The examination may be written or oral. The local inspectors in each district determine the scope and extent of the examination. The result is that the examinations in the various districts are not uniform, varying in scope and difficulty according to the views of the local inspectors in each of the districts. The examinations to obtain licenses in some districts are much less difficult than in other districts. The result is quite unsatisfactory. There should be as nearly as possible a uniform standard examination required in all districts. This result could be best obtained by giving to the supervising inspectors the power to formulate examination papers on which the local inspectors examine the applicants. The local inspectors

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might, in case they see fit, supplement the uniform examination papers by further examination, oral or written, as they think best, to satisfy them as to the qualification of any individual applicant. This power would take care of cases where, for any reason, an applicant may have obtained advance information of the examination questions.

Once a license is granted the law provides that it shall remain in force for the term of five years. Instead of that the license should be permitted to run only during good behavior of the officer holding it. The re-examination of masters, mates and pilots is limited under the present practice to sight, color vision and hearing, yet the license, if the applicant has passed these tests, is re-issued completely as though there had been a re-examination on the merits.

The re-examinations as now conducted are inconvenient, and consume much of the time of the shore leave of the applicants. The re-issue of licenses, which occupies a large part of the time of the local inspectors in certain ports, appears to be quite unnecessary, and to constitute an inconvenience both to those who grant and to those who receive the licenses. It has been recommended that the law be amended so as to provide for a test or examination as to eyesight, color vision and hearing which every master, mate or pilot licensed would be required to pass at least once in every five years. This examination should be made by the officers of the Public Health Service and the licensee should report the result to the inspectors, thus taking from the inspectors the entire burden of re-examining officers. Under this amendment the inspectors should be given the power to discipline as for misconduct an officer who does not report the result of the examination in accordance with the law.

LAWS SHOULD INSURE GOOD MORALE

Not only should the law be drafted with the idea of insuring the competency of officers, but it should also be drafted to insure the morale of a ship's crew. This means that authority should not be undermined in any way whatsoever. The statutes should be amended so as to place on the master alone the duty of reporting to the inspectors all accidents or occurrences producing serious injury to the vessel, instead of placing the duty on all officers as is the case under the present law. It seems obvious that any accidents or occurrences producing serious injury to a vessel would be within the knowledge of the master. It would tend to decrease discipline and order lines if officers or engineers were under duty to report directly to the inspectors matters within the knowledge of the master. The statutes should provide for the suspension or revocation of licenses for failure to perform the duty imposed by such an amendment, as such dereliction would clearly be construed as misconduct.

The present law gives the local inspectors power and imposes upon them the duty to investigate all acts of incompetency or misconduct committed by licensed officers, and also to examine and try officers after such investigation has been made and charges have been preferred against them. It has been recommended to the Shipping Board that this provision of law is objectionable for these reasons:

First: It violates all principles of justice by making the same person or body both the prosecutor and the trier of an officer.

Second: An officer summoned before the Board of Local Inspectors sitting as a board of investigation is not given the opportunity or the right to be represented by counsel which is also in violation of our well-recognized standards of justice.

Third: In some of the districts such as New York and Chicago, a very large part of the time of the inspectors is occupied by the examination and trial of officers, which very greatly interferes with the execution of their other duties.

Under the present law as now administered, an officer who has committed an act which has been complained of, is summoned before the local inspectors and interrogated by them. He is not represented by counsel, with the result that information or evidence in proof of his innocence of the acts complained of is not elicited. This is obviously unjust. Therefore, if the local inspectors see fit to prefer charges, the officer is brought to trial before the same inspectors who have investigated the charges against him and evidence taken on the preliminary investigation is used against him. It is clear that an officer cannot obtain a fair and impartial trial before a body who has already considered the evidence and preferred charges against the man. This procedure is as wrong in principle as though a man charged with crime should be tried before the grand jury that indicted him.

It is important that the investigation of charges preferred by the investigating body should be performed by or had before different officers or bodies. Therefore it has been recommended that the law be amended so as to provide that the local inspectors, after investigating acts or complaints of incompetency, etc., shall prefer charges and file them with the supervising inspector of the district, who shall convene a trial board consisting of three local inspectors, chosen from local inspectors' districts within the general inspection district, other than those who have taken part in the investigation; that such a trial board shall, after due notice, proceed with the trial of the case on testimony adduced before it, other than testimony taken upon the investigation, and that if the majority of the trial board is satisfied that the officer on trial is guilty of the offense charged, and shall recommend that his license be revoked, suspended or reduced in grade for such time as may be proper, the recommendation be transmitted to the local inspectors who preferred the charges and that they shall execute the recommendation.

MORE EQUITABLE PUNISHMENT LAWS DESIRABLE

Under the present law the inspectors have not the power to reduce a master or officer to a lower grade, as a method of punishment for misconduct. The only power the board has is to revoke or suspend the license. In case an officer is guilty of some offense for which his license should not be revoked, the only alternative that the local inspectors now have is to suspend a man's license, during which time his means of livelihood are taken away. This may in many cases be a very extreme hardship on the officer, whereas, if the local inspectors punish the man by reducing the grade of his license for a certain period of time, the officer could be adequately punished without taking away from him his means of livelihood.

The codified statutes should aim in every way to elevate the station of ship officers. That should be the animating spirit with which the laws should be rewritten. Consequently it is just as objectionable to have upon the statutes a provision of law which tends to make spies and sneaks of seamen as it is to make possible easy graft in the granting of licenses. The present law provides that one-half of the penalty for which a vessel shall be liable is to be paid to the informer. This, obviously, should be repealed, and the statutes should provide that the vessel may be seized only by leave of the United States. Such an amendment would obviate the possibility of the use of the vessel being unduly interfered with by some informer acting on his own initiative and actuated by a desire to recover one-half of the penalty.

Amendments to the navigation laws such as these, especially inasmuch as they have received such wide endorsement by all who have the least direct interest in the industry, warrant courteous consideration. A memorial to the Shipping Board asking for their consideration was filed on March 5, 1920. That memorial is now more than three years old. Nothing final and complete has been done. Still the shipping world struggles along under handicaps which might so easily be raised by legislative action. The arguments advanced for this revision and codification of the statutes are all valid. They especially commend themselves inasmuch as the revision will not redound to the detriment of the public but will actually enhance the interests of the merchant marine and thereby create a better agency to serve the public.

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What Vessels Are Needed to Give the United States a Well Balanced Merchant Marine?

Will the Vessel Pay Is the Question That Must Be Answered in Determining the Character and Number of Additions to Our Fleet

By Joseph W. Powell
Former President, United States Shipping Board, Emergency Fleet Corporation

OF the various definitions of the word "balance" that appear in Century Dictionary the one that most nearly fits this application follows: "To bring into a state of equality."

The term "well balanced merchant fleet" has been used so often that it has been accepted as having a definite meaning, but a moment's reflection shows that for this to be true some *standards* must first be established; without this the term is meaningless.

The unanswerable argument for a merchant marine is that the national defence requires it as an auxiliary in time of war and without such aid our naval and military forces are impotent. Many other reasons may be debated, but this is axiomatic.

The next most powerful argument, to my mind, is that an American merchant marine is necessary to the proper expansion of our overseas trade. If this is accepted, a well balanced fleet must have sufficient units of various types to meet the trade requirements of the country. In fruit steamers, for the fleet under this flag, there must be tonnage to meet needs in this special trade which must be sufficient to hold America's share against the world. In oil tankers there must be enough to carry our petroleum business and to protect it against the upsets that might result from a war time withdrawal from our trade of all bulk tankers under belligerent flags. For passenger service there must be vessels of number, design and speed to meet the commercial needs of the country for communication in its foreign commerce. The United States cannot afford to have its commercial agents travel to Buenos Aires from New York, via Southampton, nor to Australia via England and the Mediterranean, nor to have this communication interrupted when other nations are at war. These ships, to meet the military and commercial needs, must *average* in size, speed, accommodations and economy, at least equal to the similar vessels of the competing nation.

Is a "Well Balanced Merchant Marine" One That

—will meet all the war time needs of the Army and Navy by providing ample transport accommodations and ample fuel and provisions and other supplies?

—is so proportioned as to be suitable to carry some established proportion of each kind of ocean commerce, say one-half the passenger trade, one-half the fruit business, one-half the bulk cargo trade?

Would fleets meeting the above requirements be "well balanced" whether speeds were high or low, whether vessels were steam driven or fitted with internal combustion engine, whether they were old or new?

Would a fleet "well balanced" for Country A be "well balanced" for Country B?

What a Well Balanced Fleet Should Provide

The ideal "well balanced merchant marine" that "brings into a state of equality" the various elements of that fleet, should therefore provide:

(1) Vessels of all types in sufficient numbers to meet at least the minimum of the nation's probable need in times when it is at war.

(2) Vessels of all types to carry on a reasonable proportion of its sea borne foreign commerce with especial regard to conditions when other nations are at war.

(3) These vessels must on the average at least equal the average of the competitor nations in design, speed, accommodations and economy.

Now no nation ever had a "balanced merchant marine" nor will such a one ever exist in this imperfect world. But with accepted principles upon which to base comparison, it is possible to draw conclusions as to the present complexion of the United States fleet. Even so, each element must be considered by itself and with not much regard to the other elements.

I do not grant, for instance, that we are now long on tanker tonnage. The recent California oil flood has filled our fleets which are today necessary to meet the nation's needs. Had less tankers been available we might be seeing foreign flag vessels plying between American ports. On the other hand, there will be general agreement that in slow, bulk cargo vessels we have a surplus beyond any possible need that many will believe should be broken up, to speed the day when world requirements and world tonnage may again come into equilibrium. Of the other elements, passenger ships, refrigerator vessels, etc., each must be measured by the accepted standard to determine what changes in its present units would produce this ideal fleet.

However, only one practical consideration finally influences this situation. Those units will be added to the fleet that offer chance of satisfactory return on the money invested. Except in so far as Government aid—now not very imminent—may foster types to meet special national needs, this consideration, and this alone, will settle the character and number of additions to our fleet.

If the United States is to compete successfully with foreign shipping, it must have ships equal or superior to those operated by foreign nations in the respective trades, and this will require a building program covering the various types of high class ships in which our merchant marine is now so deficient. —*W. F. Gibbs, President, Gibbs Brothers, Inc.*

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Fast Refrigerator Vessels Needed for South American Trade

By Stevenson Taylor, President, American Bureau of Shipping

WE seem to be amply supplied with freighters left over from the war program. It is necessary, however, to make many of them fit present day requirements, by modernizing the propelling power in order to obtain the greatest possible efficiency.

Additional medium sized passenger ships are necessary both for our foreign and coastwise trades. These can profitably be used in extending our ocean borne commerce and will form a much desired nucleus of transports for purposes of national defense.

Although our supply of tankers is sufficient for the immediate present, it requires no stretch of the imagination to see that in the very near future additional tanker tonnage will have to be constructed.

We are greatly deficient in refrigeration facilities for overseas requirements. In my opinion there will soon be an urgent demand for such tonnage both in our intercoastal trade and in the trade between the two great American continents. The juxtaposition of climatic conditions make an interchange of seasonal vegetables, fruits and meats very desirable to comport with the rapidly changing standards of living. This can best be accomplished by utilizing comparatively fast vessels which are provided with large refrigeration capacities.

Both Passenger and Cargo Ships of Suitable Size and Speed Lacking

By Carl E. Petersen, Naval Architect, United States Lines

A BALANCED merchant marine for the United States necessarily implies a fleet of sufficient size, composed of vessels of various types suitable properly to carry a majority of our foreign commerce; that is, our imports, exports, passenger travel to and from the United States, and immigration. Under no circumstance, should we be dependent on foreign shipping.

A detailed study of our commerce reports will indicate the number and types of vessels we require. In a general way it may be said we are sorely lacking in (a) moderately high speed passenger and mail steamers, 600 to 750 feet in length; (b) combination passenger and cargo steamers, 500 to 600 feet in length of about 16 knots speed; (c) cargo vessels of 9,000 to 12,000 tons deadweight and about 12 knots speed; (d) refrigerator vessels of 14 to 16 knots speed and (e) cargo vessels equipped with Diesel engines for propulsion.

We seem to have sufficient tankers to serve our needs for the present; this phase of the question can safely be left to the oil producing and transportation companies.

In the North Atlantic passenger service, with which I am familiar, American flag vessels are greatly in a minority. Especially do we need to augment our tonnage in this trade with suitable types, if we are to receive and to hold our rightful share of this traffic. Putting this in concrete form we require to obtain for this objective at least three vessels, 750-footers of 20 knots speed or over; two vessels, 700-footers of about 19 knots speed; and five vessels, 600-footers of about 18 knots speed. It must, of course, be recognized that before this additional new tonnage would be ordered that (a) construction costs will have to be materially lower than those at present obtaining; (b) the navigation laws will have to be favorably revised—or the Government will have to lend moderate aid to the owner to offset the higher construction costs and the restrictive laws.

To Build Ships, First Build Up the Trade That Requires Them

By Alfred J. C. Robertson, Naval Architect, The Munson Line

A MERCHANT fleet differs in every way from a naval fleet, but perhaps in nothing more than in its dependence upon the law of supply and demand. A naval fleet must be designed to meet contingencies which we hope may never arise, a merchant fleet cannot safely be built far ahead of the existing demand. If this had been generally realized a few years ago, we would have been spared the fallacy, still prevalent in politics, that a shipbuilding program could create a shipping business. Ships are only and always a means to an end, not an end in themselves, and the only permanent and satisfactory way of building a merchant fleet is by building up the trade which requires it. The Shipping Board is in the unfortunate position of having built a cart, without the horse to move it—and horses cannot be built!

Today a considerable amount of the world's carrying trade is being performed by vessels unsuitable to their present employment, and, as long as the world's trade is suffering from the present destructive influences, it is probably better to use what implements are presently available than to forge new ones which may be ill adapted to the future which is going to emerge.

The time will come, however, and perhaps more quickly than we can adequately prepare for it, when the surplus of usable tonnage will be absorbed and it will become necessary to build for specific purposes.

The movement of freight is the backbone of shipping, and this country has a large surplus of freighters, but the war tonnage still available was built for the one purpose of transatlantic service, with the great majority of ships over 8,500 tons deadweight. As a consequence there is a lack of the smaller sea-going vessels which are so necessary for building up trade and are able to move in and out of harbors where drafts are limited.

Again, there are comparatively few ships on the American Registry built for specific purposes such as the carriage of coal or other bulk cargoes, or the movement of lumber, steel or refrigerated or cooled cargoes.

The rapid growth of inland trade has already thrown a burden on the railroads which is being increasingly felt,

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whereas gasoline and other transport appliances have tended to make railroad investments less attractive than heretofore, so that there is little hope that they will be able to expand as quickly as the demands upon them are growing. It is therefore evident that more cargoes will have to move by water and that shippers will be willing to pay for the higher speeds necessary to compete successfully with the freight lines on land.

A great increase of travel for pleasure is one of the recent developments, and where ocean travel is for pleasure, luxury in all its forms is demanded. This tendency will without doubt direct business to those firms with the most up to date passenger ships, and along this line of development much has still to be done.

No reference is made to any specific means of ship propulsion. There is no doubt that the Diesel engine is making rapid strides, but the use of any particular means of moving our ships must be decided by engineers, who will take into consideration all the economic factors involved in each particular case. Suffice it to say that the Diesel engine has already proved its right to be considered as reliable as any other means of propulsion at present in use.

Large Passenger Ships Should Be Built for North Atlantic Service

By E. H. Rigg, Naval Architect, New York Shipbuilding Corporation

WHILE others have been busy replacing war losses in the passenger carrying field we have made a beginning in that field with our "State" classes of ships, since renamed after the Presidents. These vessels form only a nucleus, they are backed up by a number of ex-German liners, many of which are getting on in years. Our first use for all these vessels, new and old, was as troop transports, though the war ended before the ships building could be put in service.

Our most noticeable lack is in ships fit for the North Atlantic service. None of the vessels that we have, outside the *Leviathan* and a very few other ex-German ships, is really suitable; they are all small for that trade and well as they may fit in as a beginning on our Pacific and South American routes, they do not stack up well alongside the vessels that ply the North Atlantic.

In 1921, before the Society of Naval Architects and Marine Engineers, in New York, the writer suggested that serious consideration be given to a class of ships about 750 feet long for North Atlantic passenger service. This type of ship is needed to give balance to our fleets and especially to work with the *Leviathan.*

In the Spanish and again in the late war, our lack of ships fit to carry troops was such as to cause the utmost anxiety to those responsible. In the case of the Spanish war, our shipping people know full well that we had to buy many entirely unsuitable vessels. Things were different in the late war, but not thanks to the suitable ships we had meanwhile built. It should be mentioned that such few transports of our own build as were available did their jobs well, some very well.

Briefly then, we need passenger ships of the larger class and particularly some running mates for the *Leviathan,* which is operated by the United States Lines as the flagship of the American merchant marine.

As time goes on our Pacific and South American routes, especially the latter, will need improved ships, designed for these routes. The many excellent foreign liners to South America will need counterparts from New York.

Our coastwise routes have not been strengthened materially, except in isolated instances, since the war began. Many new vessels have been projected, some have been laid down and put into service; this field would appear to offer scope for new and improved types of vessels when conditions as to building costs, etc., warrant laying down new keels.

Refrigerator ships are another lack. The California fruit trade would be materially helped by some intercoastal boats running via Panama; a passenger service also could be built up and maintained with the same ships. The Hog Island "B" type ships might serve here, if equipped with refrigerating machinery and insulated holds.

There will be occasional cargo boats of special types, but no general building of this class can be expected for a few years.

Oil tankers built and in service appear ample to handle the business now offering but this branch will need ships in the comparatively near future, especially if new oil-producing fields are opened up in South America.

Our inland water borne commerce is again being developed, and the new Erie Canal, the Mississippi and other water routes are being served by modern vessels, specially designed for the routes concerned.

Special Types of Vessels Needed for Special Trades

By Hugo P. Frear, Naval Architect, Bethlehem Shipbuilding Corporation, Ltd.

THE question of rounding out or balancing our merchant marine fleet is a vital one, if we are serious, as a nation, in our desire to keep it alive and also to take full advantage of trades which demand vessels of greater economy and in many cases vessels of special types. This has been a recognized and more or less discussed problem ever since the close of the war. Anything like a satisfactory solution will demand more favorable marine laws under which to operate and much faith, courage, time and no little financing. The following paragraph is quoted from the writer's discussion of Mr. E. H. Rigg's paper on "The Design and Construction of Passenger Steamers," read before the Society of Naval Architects and Marine Engineers in 1921.

"Our new merchant marine built during the war was not based on a prearranged, well thought out program, but on a hit or miss plan, resulting in an unbalanced fleet for either war or peace service, including a multitude of vessels worth less than scrap, and very few suitable for special trades. On this account it seems evident that passenger steamers and vessels for special trades are the ones shipbuilders must depend upon in the immediate future for new orders."

A large number of wooden vessels have been scrapped and a very few sold for restricted commercial purposes. It has also been suggested to scrap all useless vessels. If this were carried out intelligently, it would simplify the problem under consideration but would not balance our fleet. It is understood that a thorough survey has been made of the vessels

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composing the Shipping Board fleet, but it is not known whether or not the full report will be published or how much assistance it would be in determining what ships fall in the useless class.

Many of the better type of the general cargo vessels could no doubt under more careful design be greatly improved upon both as to hull and machinery. Much thought and labor have been expended toward substituting Diesel engines in a great many of these vessels under conditions thought to be sufficiently favorable to insure their economic operation. These improvements, however, would not even balance this part of the fleet. There are too many small vessels, and too few fast freighters. There should be a greater proportion of the larger type of freighters capable of a sea speed of not less than 13 knots, for the quicker dispatch of high class cargoes.

When the old tramp steamer came into vogue there were comparatively few special trades or few trades for which this type was not generally accepted as being more or less satisfactory in meeting all ordinary requirements. There are now so many special trades that special types are necessary to meet the more exacting conditions. Among the special types that might be suggested to round out or balance our fleet may be mentioned the following:

(1) Some faster general cargo vessels.
(2) Faster cargo vessels with more cold storage space.
(3) Fast fruit steamers for coast to coast trade.
(4) A better type of lumber vessel.
(5) Combination lumber and steel products vessel.
(6) A few steamers suitable for carrying locomotives.
(7) More passenger steamers.

Success of the Special Ore Carrier

That special types pay is perhaps most strikingly illustrated in the case of the 21,000 deadweight Bethlehem patent type of ore steamers, accounts of which have been published a number of times. There are five of these vessels at present bringing iron ore from Chile. Their success has so thoroughly demonstrated the advantages of this special type of ore carrier that three more vessels of the same tonnage are now under construction and will soon be in commission. This special type of vessel is equally well suited for carrying oil, or any other liquid cargo, in bulk, copper, pig iron, steel or steel manufactured products or any kind of heavy dry bulk cargo.

These Bethlehem steamers are not only the best types for ocean ore carrying but are a good example of how a special design can be worked out so that the vessel will be at no disadvantage in many other trades. With this thought in view vessels can generally be designed so that while supreme for their intended special trade yet they are at no disadvantage in at least some other lines. There is frequently a tendency to hold off on vessels for special trades on account of an erroneous assumption that it might be uneconomical to employ them, during an emergency, in any other trade.

American Passenger Vessels Should Provide Accommodations and Service Similar to Those Found in Modern American Hotels

By H. F. Norton, Naval Architect, Newport News Shipbuilding and Dry Dock Company

IT has seemed to me that we have not yet on the ocean a distinctly typical American passenger ship. The Europeans gained such headway in building ocean going passenger vessels, that we have apparently attempted rather to follow in their footsteps than to develop distinctive types of our own. Even our coastwise passenger ships bear distinct evidences of having been copied after European designs, and of course, our present greatest pride, the *Leviathan,* while a very great credit to American genius and ingenuity in her complete rehabilitation, and while up-to-date and American in many respects, is necessarily European in her general arrangement. Also in her reconditioning, many of the European details were copied or restored.

After all, an ocean going passenger ship is a floating hotel, and since on a several days' trip the passengers have no particular business on hand except to entertain and amuse themselves, or to be amused and entertained, it perhaps parallels a resort hotel rather than a metropolitan one, but partakes something of the character of both. Such being the case, there seems no good reason why the American ships should not differ from European ships as much as our modern hotels do from European hotels. The modern American hotel usually has one large space where the guests gather to converse, smoke, write and listen to the music, rather than half a dozen smaller places devoted to various matters. There is usually not a smoking room for men only. Small card rooms and tea rooms which may be occupied by private parties are sometimes provided and are found a popular feature. A gymnasium with mechanical horse, trunk vibrators, and such playthings, is not an American institution for hotels or resorts. A more desirable and typical feature would seem to be a baseball, tennis and golf cage, which apparently might readily be provided on some of the upper decks. Personally, if there were no opportunity for anything better, I should rather have see-saws, slides and swings in the open air, such as are provided for real American children.

No modern American first class hotel fails to have at least a private toilet and lavatory in a small separate space for each bedroom, and I believe the time is coming when no ship will offer a first class stateroom without at least similar accommodations, and if a lavatory must be put in a bedroom, it should certainly be of the good honest American sanitary type, with open plumbing and not have a lot of cupboards and other contraptions around it. The old hotel idea of three or four beds in a room at a charge of about 50 cents or $1 per bed a night has gone to the scrap heap. The modern American ship should have for all first class accommodations, single and double rooms with at least private toilets, lavatories and large size clothes closets. These closets should be large enough readily to accommodate ordinary baggage. The rooms should connect for the accommodation of families or parties. There should also be a goodly number of rooms with private baths or showers, or both, and with private sitting room attached. All first class rooms should be large enough to permit the serving of meals in the stateroom, if desired, and every ship should be arranged for this service, similar to the modern American hotel floor service.

Such accommodations will, of course, require extra charges, but I believe that the extra charges will be cheerfully met as the advance hotel rates have been met and will more than pay for the extra space. The old two and three berth staterooms will be relegated to second and third class. The coastwise operators are beginning to see this, and it is an encouraging sign.

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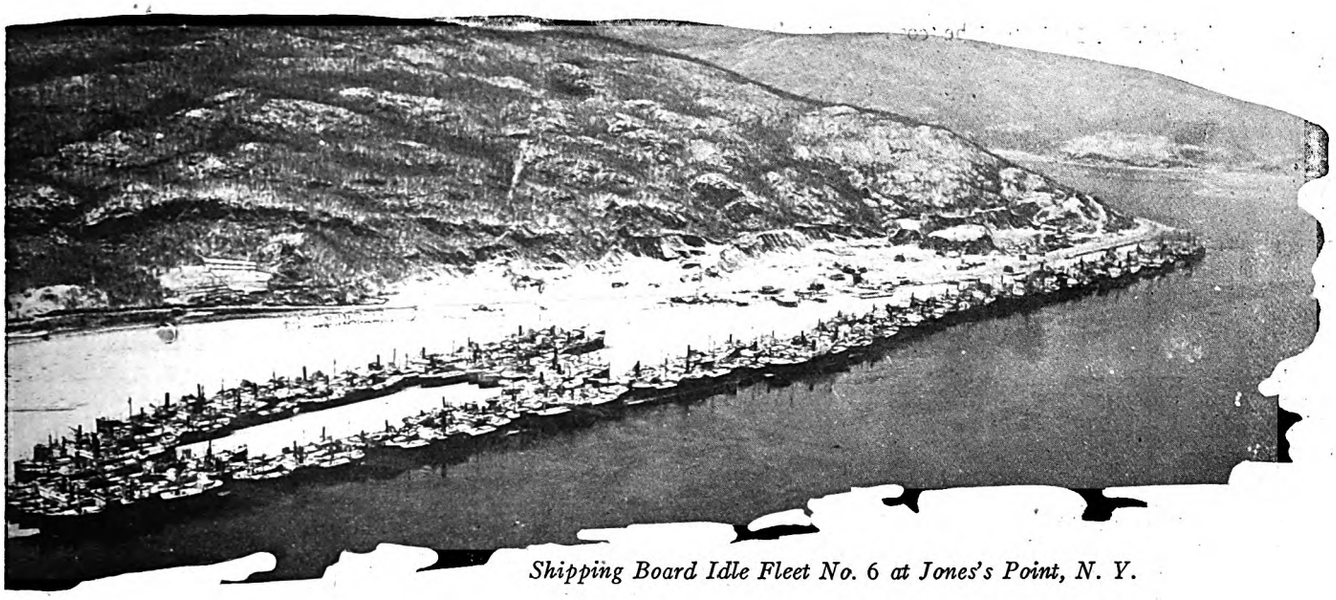

Shipping Board Idle Fleet No. 6 at Jones's Point, N. Y.

What Part Will Motorships Play in Our Shipping?

Conversion of Certain of the Idle Shipping Board Steamers to Motorships Will Make the Nucleus of an Efficient Privately Owned Merchant Marine

By Angelo Conti*

ACCORDING to a statement recently issued, the following vessels remained under control of the Shipping Board, as of September 1, 1923:

TABLE I.—COMPOSITION OF SHIPPING BOARD FLEET

	Operating or Spot	Laid-Up	Total	Deadweight Tons
Cargo	365	801	1,166	8,059,632
Tankers	19	20	39	331,434
Refrigerators	2	12	14	100,949
Passenger	30	3	33	.....
Transports	..	5	5	.....
Tugs	26	9	35	.....
Damaged and obsolete	..	40	40	297,306
Total	442	890	1,332	8,789,321

As a result of the recently completed work of the Central Survey Committee of the Shipping Board, these vessels have been classified under the following headings:

Class A—Steel vessels of good design, well built, equipped with reliable machinery and deck auxiliaries, and capable of continuous operation with normal upkeep. The estimated cost of repairs varies from a maximum of $15,000 for lakers to a maximum of $35,000 for all other types.

Class B—Of the same type as Class *A*, but requiring repairs and overhauling in excess of $35,000.

Class C—Ships of good type, with well built hulls in a fair state of preservation, but less desirable than *A* and *B* because of deficient machinery. The latter, however, could be replaced at a cost not exceeding $100,000 per ship. Vessels of this class are all fitted with Scotch boilers and geared turbines.

Class D—Includes vessels of good design and competitive type but fitted with machinery that will require extensive renewal, in varying degree, and are desirable hulls for conversion to Diesel propulsion. Only the best built hulls in a fair state of preservation are included in this class, in order that they may be converted, at a reasonable cost, into competitive and valuable additions to the American merchant marine.

Class E—Vessels considered in general unsuitable for American flag operation.

Class F—Vessels of obsolete types, too old to be rejuvenated or too badly damaged to be serviceable.

The following table gives the apportionment of the vessels among the various classes:

TABLE II.—CLASSIFICATION OF SHIPPING BOARD FLEET

Class	A		B		C		D		E		F		All Classes		
Status	Spot and Oper	Laid Up	Spot and Oper	Laid Up	Spot and Oper	Laid Up	Spot and Oper	Laid Up	Spot and Oper	Laid Up	Spot and Oper	Laid Up	Spot and Oper	Laid Up	Total
Lakers	...	24	...	116	...	...	..	12	11	163	...	...	11	315	326
Cargo	309	69	...	58	18	48	27	310	...	1	...	27	354	513	867
Tankers	8	12	1	2	10	...	..	6	...	...	...	13	19	33	52
Refrigerators	2	3	...	...	...	3	..	6	...	...	...	...	2	12	14
Total	319	108	1	176	28	51	27	334	11	164	...	40	386	873	1,259
Total for class	427		177		79		361		175		40				

In addition to the above, all vessels of special types are classed separately as follows:

Army transports	5	Competitive units in good condition.
Passenger vessels	33	Includes 3 laid-up ex-German vessels.
Tugs	35	Wood and steel.

Omitting from consideration all vessels of special types, Table II shows 1,259 ships of all classes.

Of this number, the 40 of class *F* will soon be relegated to the scrap heap and of the remainder, 326 are lake-built. Of these lake-built vessels, 152 have medium draft ranging from 19 to 21 feet and, as they are well built and have reliable machinery, they should eventually be absorbed by

*Consulting engineer, formerly manager technical department, Emergency Fleet Corporation.

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our coastwise or West India trade. The remaining 175 lake vessels have excessive draft for coastal service and are too small for successful trans-oceanic operation. They are, however, of good construction, and, if offered for world-wide sale at a reasonable price, it is likely that a substantial number of them would be disposed of to trades in no way competing with American interests. The remaining vessel of class *E* is a collier, undesirable, in her present condition, for American operation.

We need then consider but 892 vessels, of which 386 are in operation or held in readiness for immediate requirements.

The majority of the active vessels are engaged in foreign trade under the mandates of the Jones Act. Unless this very constructive legislative measure is repealed, and American vessels retired from overseas commerce, the greater portion of these 386 vessels will always be required, whether under government or private control, and with the adoption of suitable policies, they should eventually pass to private ownership.

Likewise, the 195 laid-up vessels of classes *A*, *B* and *C* can be considered as an immediate operating reserve.

The real problem therefore centers on the disposal of the 361 ships of class *D*. Comprised of generally well-built hulls of competitive type, totaling 2,646,823 deadweight tons, and obtainable at nominal prices, this class represents the largest portion of the world's tonnage most ideally suitable for conversion purposes.

The following table gives a breakdown of this class:

TABLE III.—CLASS D—CARGO TYPES: 349 VESSELS—2,565,662 DEADWEIGHT TONS

No.	Av. Dwt.	Length	Beam	Depth	Draft	Block Coeff.	Load Displ.	Bale Capacity
16	9,725	395' 6"	55' 0"	34' 11"	27' 0"	.796	13,350	452,750
9	9,526	402' 0"	54' 0"	33' 9"	26' 10¾"	.775	12,910	491,100
38	9,433	402' 6"	53' 0"	34' 6"	26' 5½"	.783	12,620	456,680
76	8,735	401' 0"	54' 0"	32' 10"	25' 2"	.785	12,225	442,880
14	8,729	410' 5½"	54' 0"	30' 0"	24' 1"	.803	12,260	417,780
17	8,636	410' 5½"	54' 0"	29' 9"	24' 2"	.798	12,220	417,780
29	8,394	410' 5½"	54' 0"	29' 9"	22' 11¼"	.804	12,195	415,000
7	7,651	380' 0"	53' 2"	29' 4"	23' 8"	.786	10,732	376,600
5	6,306	340' 0"	49' 0"	28' 7¾"	23' 1½"	.802	8,835	256,120
2	5,940	341' 0"	48' 0"	27' 3"	22' 5½"	.806	8,520	265,340
112	5,300	324' 0"	46' 0"	28' 6"	22' 10"	.783	7,615	226,150
8	5,273	324' 0"	46' 0"	27' 8"	22' 6"	.78	7,350	232,000
4	5,128	320' 9"	46' 0"	26' 9"	22' 1½"	.802	7,490	231,730
12	3,545	251' 0"	43' 6"	24' 2½"	21' 0"	.805	5,280	161,500

TABLE IV.—CLASS D—TANKERS: 6 VESSELS, 42,187 TONS DEADWEIGHT TONS

No.	Av. Dwt.	Length	Beam	Depth	Draft	Block Coeff.	Load Displ.	Cargo, Cu. Ft.	Oil, Gallons
6	7,031	365' 0"	50' 9"	31' 3"	24' 5"	.794	10,225	48,170	2,412,390

TABLE V.—CLASS D—REFRIGERATORS: 6 VESSELS, 38,974 TONS DEADWEIGHT TONS

No.	Av. Dwt.	Length	Beam	Depth	Draft	Block Coeff.	Load Displ.	Cargo, Cu. Ft.	Capacity, Refrigerated
4	5,589	340' 0"	49' 0"	28' 7¾"	23' 1½"	.802	8,835	.....	207,850
2	8,370	402' 6"	53' 0"	54' 6"	26' 4¾"	.783	12,590	51,630	307,870

The Class "D" vessels, therefore, can be summarized as follows:

Cargo	349 vessels	2,565,662 tons dw.
Tankers	6 vessels	42,187 tons dw.
Refrigerators	6 vessels	38,974 tons dw.
Total	361 vessels	2,646,823 tons dw.

Of this number 14 have geared turbines and Scotch boilers, 262 have various makes of geared turbines and watertube boilers, and 85 have reciprocating engines and watertube boilers.

The cost of the replacements needed to make these vessels reliable and economical may be gathered from the following estimates, which were obtained by informally submitting comprehensive specifications to several leading yards and ship repair plants:

To retube a main condenser of 2,500 horsepower	$6,000
To replace unsatisfactory condensing auxiliaries	10,000
To replace a set of 2,800 shaft horsepower cross-compound turbines, install 200-degree superheaters and effect all necessary alterations	95,000
To replace 3 watertube with Scotch boilers in a 2,500 indicated horsepower reciprocating engine, install 125-degree superheaters and effect all necessary alterations	100,000
To replace 3 watertube boilers with Scotch boilers fitted for 200-degree superheat, as required for 2,800 shaft horsepower cross-compound turbines	110,000

The cost of replacing the various unsatisfactory items, therefore, would range between $110,000 and $215,000 according to the combination of machinery.

The question now logically arises whether the above enumerated replacements would be as well justified on the score of economy as they are from the standpoint of increased reliability. At the present time the majority of vessels in operation average a fuel consumption of from 1.3 to 1.5 pounds per horsepower; turbines and reciprocating engines alike; a few a little less but many somewhat more. This is not surprising as in the case of geared turbines each 10 pound drop in steam pressure means a loss of 1 percent, each 12 degrees of decreased superheat a loss of 1 percent, while a drop in vacuum from 28 to 27 inches entails a further loss of 3 percent. In the case of reciprocating engines the unavoidable losses due to the progressive wear of main valves and piston rings are most difficult to estimate and both types of steam installations are equally adversely affected by the skill of the firemen in controlling the efficiency of combustion, the progressive sooting up of the boiler heating surface, the loss of vacuum by air leakages and warm sea water and by the failure of the engineer on watch to curtail the use of auxiliary steam or to properly utilize the surplus auxiliary exhaust.

Most of the turbines in question were designed for 50 degrees to 75 degrees of superheat and a nominal steam consumption of 12 to 12.5 pounds per shaft horsepower, and, if replaced with ruggedly-built and reliable units suited for 200 degrees superheat, a saving of from 2.5 to 3 pounds of steam per horsepower would be quite possible. In the case of a 2,800 shaft horsepower installation operating 180 days per annum such a replacement would effect a fuel improvement of 6 tons per day, or a yearly saving of $11,900, which is about 12.5 percent on the cost of replacement. Should the boilers also need renewal the return would be but 5.8 percent on the investment; improvement of the auxiliaries would further reduce it to 5.5 percent.

In the case of reciprocating engined vessels, the replacement of unsatisfactory watertube boilers with Scotch boilers an increase of superheat from 50 to 125 degrees would entail a saving in fuel of approximately 7 percent. This means that the daily fuel consumption of the average 2500 indicated horsepower installation, could be reduced from 35 to 32.5 tons, approximately $5,000 per annum, which would return less than 5 percent on the investment.

While opinions may differ as to the possible ultimate savings, the above figures are based on actual average performance and represent a fair estimate of what may be expected with skillful operation. It should be noted, however,

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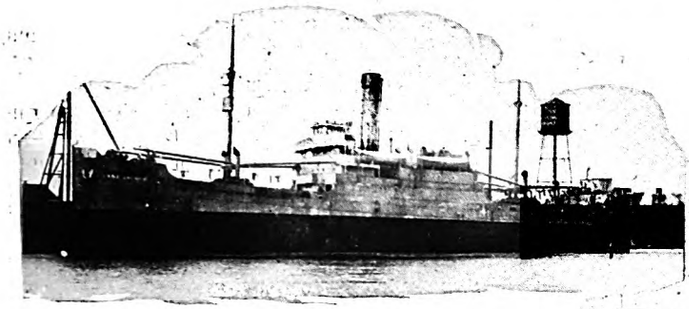
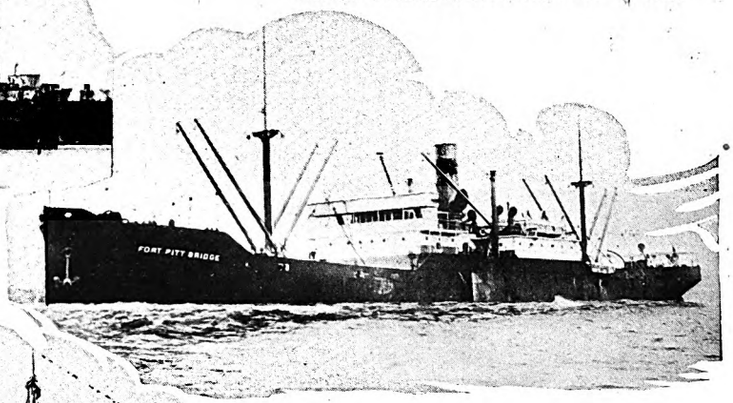


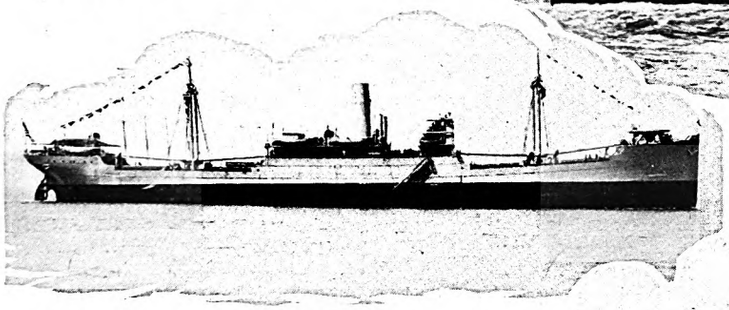
Design 1020—Typical Laker, Over 300 Available

Length B. P., 251′; beam, 43′ 6″; depth, 24′ 2″; average deadweight, 3500 tons at 21′ draft

Design 1023—Number Available, 112

Length B. P., 324′; beam, 46′; depth, 28′ 6″; average deadweight, 5300 tons at 22′ 6″ draft



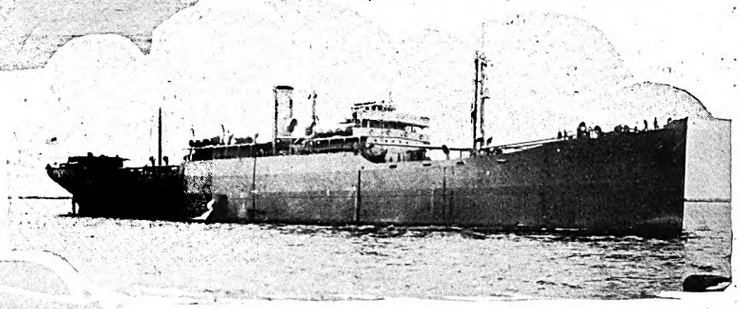


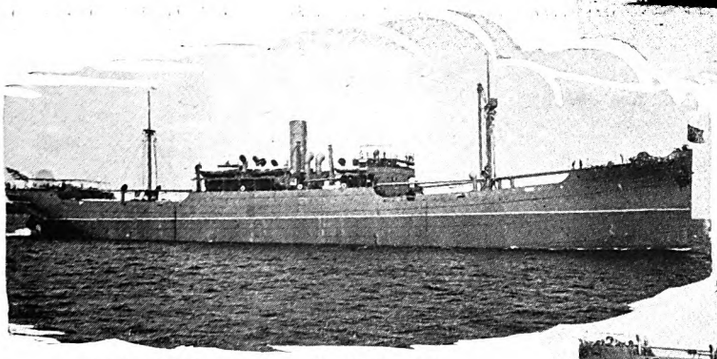
Design 1025—Number Available, 76

Length B. P., 401′; beam, 54′; depth, 32′ 10″; average deadweight, 8735 tons at 25′ 2″ draft

Design 1013—Number Available, 29

Length B. P., 410′ 6″; beam, 54′; depth, 29′ 9″; average deadweight, 8400 tons at 24′ draft



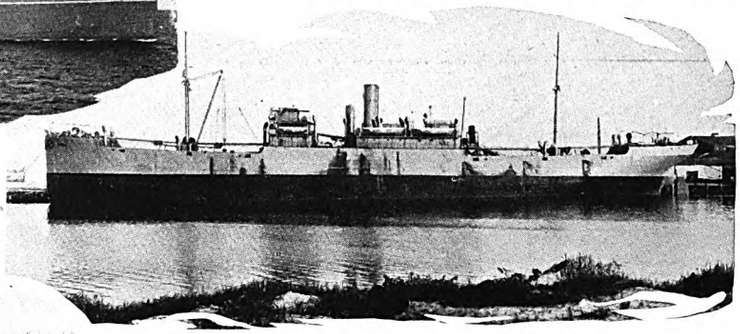


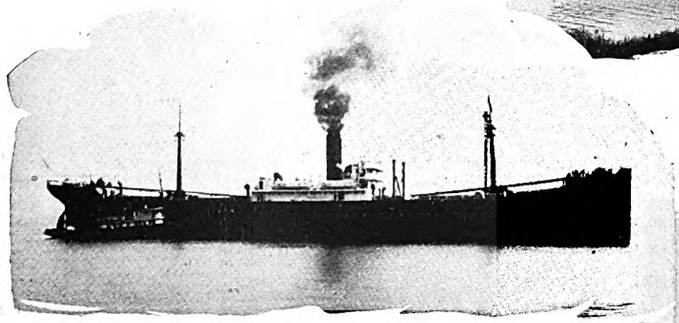
Design 1027—Number Available, 9

Length B. P., 402′; beam, 54′; depth, 33′ 9″; average deadweight, 9530 tons at 26′ 11″ draft

Design 1019—Number Available, 17

Length B. P., 410′ 6″; beam, 54′; depth, 29′ 9″; average deadweight, 8640 tons at 24′ 6″ draft



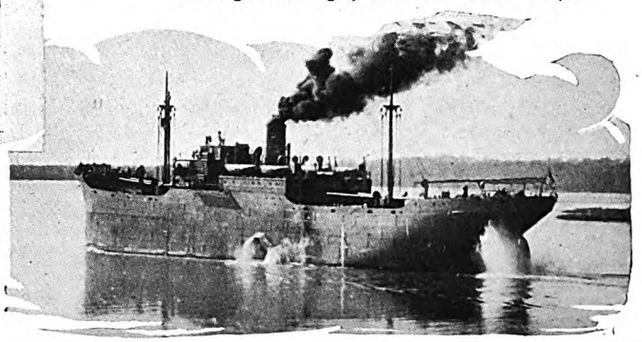


Design 1037—Number Available, 16

Length B. P., 395′ 6″; beam, 55′; depth, 34′ 11″; average deadweight, 9725 tons at 27′ draft

Design 1015—Number Available, 38

Length B. P., 402′ 6″; beam, 53′; depth, 34′ 6″; average deadweight, 9430 tons at 26′ 6″ draft



Typical Shipping Board Vessels Available for Conversion to Diesel Propulsion

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that the use of higher superheated steam will require more intelligent care and will be attended by somewhat greater maintenance costs.

In the case of Diesel machinery, however, the elements affecting the economy of operation are entirely automatic and largely independent of the engineers' operative skill. The admission of fuel is under governor control so that in bad weather dangerous racing is considerably reduced and power is developed with considerable uniformity.

The relative merits of steam and motorship operation being best demonstrated by actual performance, the following comparative data on two sisterships owned by the Shipping Board should be of particular interest.

One is the twin screw motorship *William Penn* fitted with Burmeister and Wain six cylinder engines, each rated 2100 indicated horsepower at 105 revolutions per minute and with engineroom and deck auxiliaries electrically driven from three Diesel generators of 65 kilowatts each. The other is a single screw steamer, operated by a quadruple expansion engine designed for 3200 indicated horsepower at 75 revolutions per minute. Steam is supplied by three Scotch boilers and the engineroom and deck auxiliaries represent good marine practice.

Barring a slight fining in the motorship's after body, both vessels have substantially the same lines, the same general dimensions, were constructed after the war by the same yard and can be considered as typical equivalents of the two methods of propulsion.

Table VI.—Comparison of Actual Performance, Steamer and Motorship

	Ethan Allen	William Penn			Total or
Voyage Numbers	54	1	2	3	Averages
No. of ports called	21	18	.....	.....	.....
Days at sea between pilot stations	88.7	109	.....	107.5	320.5
Total distance steamed	22,951	27,769	26,977	28,367	83,113
Average speed between pilot stations	10.78	10.65	.....	10.99	10.80
Total fuel at sea	3,220	1,419	.....	.....	.....
Total fuel in port	1,059	93	.....	.....	.....
Total fuel, sea and port	4,279	1,512	.....	.....	.....
Miles per ton of fuel	7.12	19.6	.....	20.33	19.75
Average daily fuel at sea	37.47	13.04	.....	12.98	13.13
Average daily fuel in port	22.79	.75	.....	.....	.....
Average daily fresh water	9.9	2.4	.....	.....	.....
Total cost voyage repairs engineroom	3,501	None	.....	.....	.....
Total cost voyage repairs deck machinery	None	393	.....	185.00	578.00

The *William Penn* has been in operation since September, 1921, has completed three long voyages and is now nearing the end of her fourth. The above record of her performance is, therefore, of added importance as it extends over a fairly long period. In the case of the *Ethan Allen*, only her last voyage has been given as her previous showing is not quite so good; her high port fuel consumption is explained by the necessity of maintaining steam up at Kobe and Shanghai for emergency purposes, otherwise it normally varies between 9 and 10 tons daily. In round figures the relative performance of the two vessels may be expressed by stating that on one ton of fuel the motorship covers a distance nearly three times greater than the steamer.

In addition to the above noted engineroom repairs at the end of the voyage $2,245 was spent on the steamer's heating coils for the double bottoms and deep tanks, and $1,000 for retubing and repacking her auxiliary condenser. These figures are quoted merely to show the greater maintenance costs obtaining with steam machinery by reason of the many additional channels of expenditure.

As regards relative earnings of steamers and motorships, any comparison of value would obtain only for sister vessels plying the same routes, which would be rather a rare occurrence. In the case of the two vessels whose performances were compared in Table VI, only such items as repairs, fuel and water consumptions, etc., could be included owing to the fact that as they operate on different routes their final net returns are not directly comparable.

Lacking actual data, we have, therefore, resorted to a specially prepared comparison for which we selected the 8,600 deadweight ton "Robert Dollar" type, for the reason that 136 such similar vessels are yet available for conversion. The following are the leading particulars:

Length between perpendiculars	410 feet 5½ inches
Beam, molded	54 feet
Depth, molded	30 feet 2 inches

Table VII.—Cargo Capacities—Oil-Burning Steamer and Motorship—8,560 Deadweight Tons

Range	North Atl. Ports United Kingdom		North Atl. Ports River Plate	
Round voyage, nautical miles	6,700		12,000	
Type of vessel	Steamer	Motorship	Steamer	Motorship
Round voyages, per annum	6.5	6.9	4.06	4.31
Deadweight cargo, outbound, long tons	7,110	8,135	6,540	7,870
Deadweight cargo, homebound, long tons	7,650	8,295	7,330	8,140
Total, both ways, long tons	14,760	16,430	13,870	16,010
Total deadweight cargo, per annum	95,990	113,360	56,320	69,000
Difference in favor of motorship	.....	18.1%	.....	22.5%
Total bale capacity, outbound, cubic feet	437,300	447,300	*415,300	447,300
Total bale capacity, homebound, cubic feet	437,300	447,300	415,300	447,300
Total bale capacity, both ways, cubic feet	874,600	894,600	830,600	894,600
Measurement, tons, at 40 cubic feet per ton	21,865	22,365	20,765	22,365
Total measurement tons per annum	142,120	154,320	90,800	96,390
Difference in favor of motorship	.....	8.6%	.....	6.1%
Mean of deadweight measurement cargoes, per annum	119,055	133,840	73,560	82,695
Total difference in favor of motorship	.....	12.4%	.....	12.4%

*Note—Steamer's deep tanks used for fuel outbound and unserviceable for cargo homeward.

Table VIII.—Cargo Capacities—Coal-Burning Steamer and Motorship—8,560 Deadweight Tons.

Range	North Atl. Ports S. E. Africa		North Atl. Ports Australia	
Round voyage, nautical miles	16,760		22,000	
Type of vessel	Steamer	Motorship	Steamer	Motorship
Round voyages, per annum	2.38	2.74	1.77	2.03
Deadweight cargo, outbound, long tons	5,981	7,642	5,989	7,416
Deadweight cargo, homebound, long tons	6,336	8,043	5,654	7,966
Total, both ways, long tons	12,317	15,685	11,643	15,382
Total deadweight cargo, per annum	29,315	42,975	20,610	31,225
Difference in favor of motorship	.....	46.6%	.....	51.5%
Total bale capacity, outbound, cubic feet	358,450	447,300	358,790	447,300
Total bale capacity, homebound, cubic feet	373,710	447,300	344,390	447,300
Total bale capacity, both ways, cubic feet	732,160	894,600	703,180	894,600
Measurement, tons, at 40 cubic feet per ton	18,304	22,365	17,580	22,365
Total measurement, tons, per annum	43,560	61,280	31,120	45,400
Difference in favor of motorship	.....	40.7%	.....	45.9%
Mean of deadweight and measurement cargoes, per annum	36,440	52,150	25,865	38,310
Difference in favor of motorship	.....	43%	.....	48.1%

SUMMARY OF ANNUAL OPERATING EXPENSES DUE SOLELY TO DIFFERENCE IN THE TYPE OF MACHINERY.

Table IX.—Oil-Burning Steamer and Motorship—8,560 Deadweight. Tons

Range	North Atl. Ports United Kingdom		North Atl. Ports River Plate	
Round voyage, nautical miles	6,700		12,000	
Type of vessel	Steamer	Motorship	Steamer	Motorship
Wages	$16,140	$13,530	$16,140	$13,530
Subsistence	3,084	2,198	3,084	2,198
Fresh water	2,070	402	2,156	412
Lubricating oils and stores	4,326	3,178	4,395	3,176
Fuel	79,563	29,050	88,882	32,074
Maintenance, repairs and overhauling	8,000	2,000	8,000	2,000
Total expenses for engine department	$113,183	$50,358	$122,657	$53,390
Difference in favor of motorship	.....	62,825	.....	69,267

Table X.—Coal-Burning Steamer and Motorship—8,560 Deadweight. Tons

Range	North Atl. Ports S. E. Africa		North Atl. Ports Australia	
Type of vessel	Steamer	Motorship	Steamer	Motorship
Round voyage, nautical miles	16,760		22,000	
Wages	$21,180	$13,530	$21,180	$13,530
Subsistence	4,508	2,198	4,508	2,198
Fresh water	1,950	525	1,935	525
Lubricating oils and stores	4,300	3,052	4,288	3,015
Fuel	82,860	28,925	79,950	28,265
Maintenance, repairs and overhauling	8,000	2,000	8,000	2,000
Total expenses for engine department	$122,798	$50,230	$119,861	$49,533
Difference in favor of motorship	.....	72,568	.....	70,328

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Summer load draft	24	feet 1¼ inches
Summer displacement	12,200	tons
Summer deadweight	8,560	tons
Total bale capacity	437,300	cubic feet
Fuel oil, settling tanks	80	tons
Fuel oil inner bottoms	990	tons
Fuel oil deep tanks	600	tons
Total fuel capacity	1,670	tons
Reserve feed water, inner bottoms	190	tons
Reserve feed water, fore peak	130	tons

The basic data used in the following comparisons were obtained from actual performances of a number of Shipping Board steamers of the *Robert Dollar* or similar types plying the routes under consideration, but the consumption of fuel, water, lubricating oil, stores and maintenance of propelling and deck machinery were somewhat reduced, on the assumption that the vessels would be privately operated under the most rigid supervision.

	Coal Burning Steamer	Oil Burning Steamer	Motorship
Service speed, knots	9	10	10
Fuel at sea, tons per day	45	32	10
Fuel in port, tons per day	11	8	.6
Fuel lay days, tons per day	5	3	.25
Fuel at home ports, $ per ton	8.55	11	14
Fuel abroad, $ per ton	7.40	14.10	...
Lubricating oil at sea, $ per day	4.00	4.00	5.70
Lubricating oil in port, $ per day	1.00	1.00	1.50

The data used for the motorship were based on the performance of the *William Penn*. The converted vessel was credited with an additional 10,000 cubic feet of cargo space due to the elimination of boiler casing, saddleback, etc.; and her annual overhauling period was assumed to be approximately one-half the steamers: as no time would be consumed in lengthy boiler repairs. The same time in port for loading and discharging cargo and an annual allowance of five days for bad weather was used in all cases. The machinery maintenance charges were also assumed considerably lower for the motorship, the difference being accounted for by the extra cost of repairs to boilers, deck machinery, heating coils and steaming out of fuel tanks. The following table compares the engine department payrolls for the different types of machinery, based on the present revised schedule:

TABLE XI.—ENGINE DEPARTMENT PAYROLL

Rank	Monthly Wages	Coal Burning Steamer No.	Coal Burning Steamer Wages	Oil Burning Steamer No.	Oil Burning Steamer Wages	Motorship No.	Motorship Wages
Chief engineer	$260.00	1	$260.00	1	$260.00	1	$260.00
First engineer	185.00	1	185.00	1	185.00	1	185.00
Second engineer	165.00	1	165.00	1	165.00	1	165.00
Third engineer	150.00	1	150.00	1	150.00	1	150.00
Electrician	150.00	..	.....	..	.....	1	150.00
Oilers	72.50	3	217.50	3	217.50	3	217.50
Firemen, coal	67.50	9	607.50	..	.....	..	.....
Firemen, oil	65.00	..	.....	3	195.00	..	.....
Coal passers	60.00	3	180.00	..	.....	..	.....
Wipers	57.50	..	.....	3	172.50	..	.....
Monthly total		19	$1,765.00	13	$1,345.00	8	$1,127.50
Total wages per annum			21,180.00		16,140.00		13,530.00
Subsistence @ 65c. per day			4,507.75		3,084.25		2,198.00
Total wages and subsist			25,687.75		19,224.25		15,728.00
Excess over motorship			9,959.75		3,496.25		.....

The comparative cargo carrying capacities for each route have been investigated in Tables VII and VIII, and a summary of operating expenses affected by the type of machinery will be found in Tables IX and X, all other expenditures having been omitted as they are substantially the same for both types of vessels. This assumption obtains only when equal amounts of cargo are carried; if the net additional earnings of the motorship need be computed all expenses incidental to handling the extra cargo, such as stevedoring, brokerage, etc., should be deducted from the additional freight revenues.

The above conclusively proves the many inherent advantages of the motorship, but it should be noted that Diesel machinery, by reason of greater development costs and the higher grade materials and workmanship required in its construction, is considerably more expensive than a corresponding first class steam plant of equivalent power; the cost of an up-to-date Diesel installation being further augmented by the various electrically driven engine room and deck auxiliaries. This may be inferred from the following estimates for the conversion to Diesel propulsion of certain typical Shipping Board cargo steamers of varying sizes.

TABLE XIII.—ESTIMATED DIESEL CONVERSION COSTS OF TYPICAL SHIPPING BOARD STEAMERS

Average dwt.	5,300	7,650	8,650	9,520
No. available for conversion	112	7	136	63
Total dwt.	593,600	52,560	1,175,240	599,790
Total length of machinery spaces	47' 3"	50' 0"	49' 6"	50' 0"
Average service shaft horsepower	1,400	1,900	2,100	2,250
Average service speed, knots	10.5	10	10	10
Engineroom auxiliaries	14,500	19,000	21,000	23,000
Diesel generators and electrical equipment	39,500	50,000	53,000	55,000
Deck machinery	42,000	43,000	44,000	45,000
Main engine and manœuvering compr.	154,000	200,000	218,000	230,000
Removal, alterations and installation	60,000	70,000	80,000	85,000
Drydocking, scaling and painting	6,000	7,000	8,000	10,000
Total cost of conversion	316,000	389,000	424,000	448,000
Approx. cost per s.h.p. of main engines	225	205	202	199
Approx. cost per dwt.	60	51	49	47

The above figures are based on information informally furnished by manufacturers and ship repair plants for the conversion of a moderate number of vessels of each type so as to equitably distribute development costs and overheads. They cover a first-class installation throughout, with rugged and reliable engines and electrically driven engineroom and deck auxiliaries of the highest standard. They also include drydocking, scaling, and painting, but no hull repairs of an extraordinary nature. In each case due consideration was given to the major factors affecting the cost of conversion, such as size of shafting, available space and the amount of power that can be conveniently installed without expensive structural alterations.

Obviously, conversion costs could be materially reduced by retaining most of the present steam auxiliaries, supplementing them in such a way as will avoid the constant use of donkey boiler at sea, but such an arrangement would not reduce the port fuel consumption. Whether or not the economy attending a complete system of electric auxiliaries would be commensurate to its greater cost, would largely depend on trade requirements and the character and physical status of the present steam equipment.

If to the cost of conversion a purchase price of from 5 to 7 dollars per ton deadweight is added, the final cost per ton deadweight of completely reliable and economical motorships will vary from $65 for the 5,300 deadweight ton vessels, to about $53 for those of 9,500 tons deadweight.

These prices compare most favorably with $35 per deadweight ton which includes approximately $5 per deadweight ton for a complete overhauling for the best Shipping Board steam tonnage, which is from four to five years old as an average; and with the prevailing costs of from $40 to $45

TABLE XII.—SUMMARY OF COMPARATIVE PERFORMANCE—STEAMER AND MOTORSHIP

Route	United Kingdom		River Plate		S. E. Africa		Australia	
Kind of fuel	Oil	Oil	Oil	Oil	Coal	Oil	Coal	Oil
Type of vessel	Steamer	M.s.	Steamer	M.s.	Steamer	M.s.	Steamer	M.s.
Round voyages	6.5	6.9	4.06	4.31	2.38	2.74	1.77	2.03
Extra dw. cargo	....	18.1%	....	22.5%	....	46.6%	....	51.5%
Extra meas. cargo	....	8.6%	....	6.1%	....	40.7%	....	45.9%
Mean of dw. and meas	....	12.4%	....	12.4%	....	43.0%	....	48.1%
Extra cost of operation	$62,825	....	$69,267	.....	$72,568	....	$70,328	.....

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per deadweight ton *for new foreign steam tonnage,* depending on type, speed and trade requirements. They also favorably compare with the prevailing costs of *foreign* built motorships which vary from approximately $70 to $80 per deadweight ton. It should be noted, however, that these low prices are forced by the present depression and are accepted by shipyards in preference to closing down, and as they allow no profit to the builders they are likely to rise as the demand for new tonnage increases.

In addition to the advantages previously stated, it should be noted that for round voyages in excess of a vessel's total bunkering capacity an oil-burning steamship would be compelled to bunker the maximum capacity of her fuel tanks in order to purchase the minimum of costlier fuel abroad, thereby decreasing her cargo carrying capacity, or else purchase a greater amount abroad with correspondingly increased expenditure.

A coal-burning steamship, plying the longer routes, would necessarily bunker abroad for her return trip and will have to seek the ports where fuel is cheap, which sometimes entails long and costly detours, or else submit to the prices prevailing at the ports of call.

The converted vessel, however, can carry sufficient oil in her double bottoms to practically steam around the world, can seek the most advantageous routes regardless of her fuel requirements and is, therefore, possessed of great flexibility and potential earning power.

Neglecting, however, the additional revenue possible with the increased cargo-carrying capacity, the preceding tables show that the 8,560 deadweight ton converted vessel previously considered can be credited with a saving of approximately $70,000 per annum, equivalent to a return of about 16.5 percent on the cost of conversion, whereas the major replacements of steam machinery already mentioned would yield returns varying from 12.5 to 5.5 percent. Therefore, the replacement of deficient turbines and watertube boilers does not appear as well justified as the conversion to Diesel propulsion.

Having thus far analyzed costs of conversion and savings in operation let us now investigate their ultimate effect when overheads and other fixed charges are taken into account. Taking for example the North Atlantic-River Plate route a previous table shows a saving of $69,267 for the motorship over an oil-burner. Assuming equal cargoes carried, stevedoring and other operating charges not previously included would then be the same for both types and can be excluded from computation. For the purpose of this comparison the following fixed charges have been assumed for both types:

Depreciation	6	percent per annum
Interest on purchase cost	6	percent per annum
Profit on investment	10	percent per annum
Federal taxes 12.5 percent of net revenue, or	1.25	percent per annum
Insurance	4.75	percent per annum
Total fixed charges	28	percent per annum

Based on the above premises the following table was prepared to show the comparative effect of initial costs of steamers and motorships:

(a) Cost of steamer per dwt.	30	35	40	45
(b) Investment for 8,560 dwt. steamer (a × 8,560)	256,800	299,600	342,000	385,200
(c) Fixed charges, 28 percent of above (b ÷ 28 percent)	71,904	83,889	95,872	107,856
(d) Excess operating expenses over motorship	69,267	69,267	69,267	69,267
(e) Total for steamer (c + 4)	141,171	153,186	165,139	117,123
(f) Equivalent investment for an 8,560 dwt. motorship (c ÷ 28 percent)	504,200	547,000	590,000	632,600
(g) Equivalent cost per dwt. of motorship (f ÷ 8,560)	59	64	69	74

The above shows that with a prevailing domestic market price for the best ready steam tonnage of approximately $35 per deadweight ton the top price for a converted domestic motorship fully meeting the steamer's competition would be about $64 per deadweight ton. And as previous estimates indicate that a Shipping Board steamer could be purchased and converted into an efficient motorship at an approximate total cost of $55 per deadweight ton it will be seen that a substantial differential is thus created that should materially assist the American flag converted vessel to not only meet the competition of new foreign steamers built at from $40 to $45 per deadweight ton but also of foreign motorships built at from $70 to $80 per deadweight ton.

But while Diesel hulls at a nominal price might induce well established shipowners to absorb some few vessels for conversion purposes, it is a well known fact that new companies are experiencing difficulty in obtaining the necessary financial assistance, the present high costs of domestic Diesel machinery acting as a further deterrent to a wider adoption of the motorship. Some reduction in production costs, however, are confidently anticipated as soon as a minimum of standardized sizes can be manufactured in adequate numbers, as American resourcefulness will then assert itself and excel as in other fields of mechanical endeavor.

Substantially all of the board's vessels thus far sold to private interests are carrying their owners' products or are being operated in protected trades, and from present indications it appears that there will be little further demand for such trades. Hence, it is logical to suppose that such new investment capital as is forthcoming will seek to absorb the board's ships operated in specific foreign services. Here, however, it will meet the formidable competition of an ever-increasing number of specially built foreign motorships and while reliable ready steam tonnage is obviously needed for maintaining these services, it is equally obvious that motorships need quickly follow, if the American owner, lacking the endless resources of the national treasury, is to survive.

Conversion of Class "D" Ships Should Be Expedited

Therefore, the sooner low priced motorships are forthcoming the sooner will the investor's attention be engaged in the better available steamers to meet immediate demands and in the ships to be converted to meet later requirements. Every possible incentive should then be offered to expedite the efficient conversion of a large number of Class "D" steamers in order that the absorption of those in operation and in reserve may be expected to proceed in adequate ratio, otherwise those suitable for conversion would never, in their present condition, find buyers and would ultimately decay.

If, as we hope, our premises are correct, it is believed that the following measures should prove most beneficial:

(a) Modification of the construction Loan Fund, created under Section No. 11 of the Merchant Marine Act of 1920, so that its benefits will equally apply to the conversion of the best and most efficient type American Flag steamers into reliable and economical motorships.

(b) Adoption by the Shipping Board of a liberal policy that will permit competent and responsible American citizens to absorb the board's specific trade routes by the combined sale or charter of ready steam tonnage to meet immediate demands, and the purchase of hulls for Diesel conversion to meet later requirements.

(c) Direct conversion of an adequate number of Shipping Board steamers for the express purpose of fostering domestic Diesel development.

Measures (a) and (b) would undoubtedly render all meritorious conversion projects practically self-financing; their immediate usefulness, therefore, needs no comment.

Measure (c) logically implies the substitution of motorships for steamers on the least developed and remunerative routes. In this connection it should be noted that on October 1, 1923, thirty-six Shipping Board coal burning steamers, aggregating approximately 289,000 tons deadweight, were employed on various foreign services, some being long distance routes ideally suited for motorship operation. This measure would ultimately entail many far reaching advantages.

First. Would permit American Flag vessels to survive on the less desirable and remunerative routes, thereby making possible their eventual absorption by private interests.

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Second. Would provide work for our languishing shipyards and preserve their organizations for future needs.

Third. Would develop and establish a domestic Diesel industry and eventually lead to lower production costs.

Private shipowners would then follow in the wake of the resultant advantages, government vessels would be disposed at enhanced values, and, providing a constructive general policy is also adopted, the primary object of establishing an adequate and self-sustaining American merchant marine would be ultimately achieved.

Lighter and Cheaper Diesel Engines Must Be Developed

By J. F. Nichols

Chief Engineer, Newport News Shipbuilding and Dry Dock Company

THE part that motorships will play in the merchant marine will be determined by their success or failure to earn a greater profit in operation than steam vessels.

The advantages of the Diesel engine, especially its superior fuel economy, are well known and for some time this type of engine has been developed to the point where a number of makes are available which compare favorably with steam machinery in reliability of operation. A considerable number of installations have been made, many of which are giving satisfaction to their owners and operators. In general, however, these engines, particularly in the larger powers, are inherently so expensive for the power developed that under the conditions at present prevailing in this country the charges due to the added first cost about counterbalance the saving in fuel so that the American owner frequently has not found it financially advantageous to build motor vessels.

What is needed is the development of a type of Diesel engine which shall be lighter and less bulky and expensive than the present accepted types. This problem is being attacked earnestly by numbers of experienced builders with excellent prospects for success and when we are able to build Diesel engines of proved reliability at costs which do not absorb their economy in fuel, we may look forward to rapid progress in the building of motorships.

The Probable Trend in the Adoption of Motorships

By W. W. Smith, Chief Engineer, Federal Shipbuilding Company

THE oil engine is in a state of development. The evolution is proceeding rapidly, and this process will probably continue for some time, judging from the history of the development of other prime movers such as the steam engine and steam turbine. It therefore seems best to consider two phases, viz., the immediate and the near futures. The following remarks are intended to apply to American vessels and conditions only.

While it is generally unsafe to forecast the future, the following opinion as to the probable trend is hazarded:

For the immediate future—a considerable amount of installations in small powers; a few of medium power, and practically none of high power; a number of conversion installations of medium power to Shipping Board vessels, and a very few in privately owned vessels.

For the near future—a large number of installations in small powers; a considerable number of medium power, and very few, if any, of high power.

The power referred to above is approximately as follows: Small, up to 1,000 shaft horsepower; medium, from 1,000 to 8,000 shaft horsepower; and high, from 8,000 shaft horsepower up.

The type of engine which will compete most successfully with the steam installation is important. The basic requirements for this are: (1) simplicity and reliability, (2) low weight, and (3) low cost.

Judging from a considerable number of estimates and comparisons, it appears that for an oil engine to compete successfully with the best steam installations of medium power, the following values for the main oil engine only can not be materially exceeded—(a) weight per shaft horsepower, 200 pounds; (b) cost per shaft horsepower, $70.

It seems that the above requirements can be best met by the following:

(1) Simplicity and reliability. Elimination of complication of valves, valve gears, injection air compressors, tanks and piping.

(2 and 3) Small weight and cost. Providing for an impulse on the piston every stroke for medium power engines, and every other stroke for small power engines.

At present for small powers there is very little difference between two and four cycle engines with respect to weight and cost. However, it is possible that the two cycle engine may be developed further so as to give a lower weight and cost. Since there is little indication that this possibility will be realized in the near future, the two and four cycle types will be considered approximately equal.

If these basic requirements can be satisfactorily met by present or near future oil engines, the conclusion is that the best types to compete successfully are the single acting two or four cycle engine for small powers, and the double acting two cycle for medium powers.

Let us assume that reliable engines which meet the above requirements will be available in the near future. Then it would appear that the following applications of oil engines would be advantageous with respect to the net earnings of the vessel in average cases.

Class Number	Shaft Horsepower	Number of Screws	Type of Machinery*
1	Up to 1,000	1	Oil engine. S.A. — 2 C. or 4 C.
2	1,000—3,000	1	Oil engine. D.A. — 2 C.
3	3,000—5,000	2	Oil engine. D.A. — 2 C. or
		1	Steam turbine, Scotch boilers, superheated steam
4	5,000—up	2	Steam turbine, watertube boilers, superheated steam

*S.A. = single acting, D.A. = double acting, 2 C = two cycle, 4 C = four cycle.

There is of course a wide variation in the service conditions and requirements, and this will of course materially affect the selection of machinery for the specific cases. In general, the following considerations would govern the selection for the average case.

Small Powers.—Oil engine less complicated, and simpler to operate. Fuel consumption considerably less than half, and no stand-by fuel. Cost higher. Extra cost justified.

Medium Powers.—Oil engines slightly less complicated. Fuel consumption about half, and no stand-by fuel. Cost higher. Extra cost justified in most cases up to 3,000 shaft horsepower.

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Large Powers.—Fuel consumption somewhat more than half. Flexibility and overload capacity less. Cost considerably higher. Extra cost not justified except in rare cases.

In general, the field for the oil engine in the near future will probably be in small and medium powers, and especially the former.

Twin Screws.—In small and medium powers the extra complication, weight and cost of twin screw installations does not pay and cannot be justified for ordinary vessels. The basic principles in this respect are the same as for steam installations.

Diesel-Electric Installations.—Judging from many accurate estimates and comparisons, it is true beyond question that the complexity, weight and cost of Diesel-electric installations are far in excess of direct-drive. The fuel consumption is also greater. These disadvantages cannot be justified, and it is considered a mistake to use this system for ordinary vessels. For unusual conditions, and rare cases, there may be exceptions.

Motorships Reduce the Cost of Long Voyages

By A. B. Homer, Diesel Engineer, Bethlehem Shipbuilding Corporation, Ltd.

THE ultimate problem concerning us is to increase the net return on the investment required to place our merchant ships in operation, and to maintain this net return at such a figure that our merchant marine can successfully compete with those under foreign registry.

This may be accomplished in several ways; first, by reducing the investment charge; second, by reducing operating costs and, third, by increasing the amount of cargo carried per ship and hence the gross income.

Let us take up each one of the above and see of what assistance the motorship will be.

First, the cost of machinery is being kept high primarily because not enough motorships and Diesel engines have been built to permit a reduction in cost due to quantity and standardized manufacture. Operators and owners are, therefore, defeating their own ends by holding back new construction or conversion of existing ships. This applies equally well to the development and manufacture of auxiliaries, a very important item in motorship construction costs. Conversion of existing steamers to motorships, if properly carried out in quantity, and at low hull cost, should give a reduction in the investment charge which could not be obtained otherwise.

Second, the fuel economy of the Diesel engine reduces operating costs. Here exists the greatest factor in its favor. This is particularly apparent when a motorship is operated over a long route, and, therefore, every effort should be made to operate motorships on long voyages and steamers on the short trips.

Third, the motorship will have an increased deadweight cargo capacity over a similar dimensioned steamer due to carrying less fuel oil for the same voyage distance.

It can, therefore, be readily appreciated from the above that the motorship has the inherent qualities to play a big part in the upbuilding of the American merchant marine. We need confidence, cooperation and action along constructive lines in building up our merchant marine and improving its efficiency as a competitive factor in the world's commerce.

To this end we have already been making efforts toward effecting a reduction in construction costs to reduce the investment charge, and thereby increase the net return on investment.

First Protect Our Merchant Marine, Then Develop the Motorship

By W. G. Groesbeck, Vice-President, New York Shipbuilding Corporation

MY opinion is that the Diesel engine has now been so far developed, both in the United States and abroad, that it can be regarded as a reliable type for marine purposes. With this in mind, the question remains whether, everything considered, the Diesel engine is the most available form of propulsion in a given case, having regard to first cost, upkeep, operating expense and the like. There is no general rule that can be laid down in these matters, and each case must be worked out on its merits. Personally, I believe that its field will be found in the long voyage trades. I am doubtful as to its expediency in short voyages.

Obviously what is true of American Diesel vessels is also true as regards foreign Diesel vessels; and in the world's commerce we will be confronted in motor vessels as in all other types with the differential against us due to higher building and operating costs. We cannot expect to compete with foreign flag vessels of any type unless this differential can in some way be made up.

The subsidy bill which failed last year was an effort in this direction; and was perhaps the most direct and sensible method of meeting the situation. What can now be advanced as a substitute I am at a loss to suggest. But it is obvious that we cannot compete directly, either in building or operating, with the low wages and scale of living that obtain abroad under our highly protected wages and corresponding living scale. It is true that in mass production we can sometimes do it, but ships are not built or operated in mass. Therefore, since none of us would consider reducing our living scale and wages to meet conditions obtaining abroad, it follows that we must either protect our merchant marine as we protect everything else in this country, or abandon the idea of having one.

I have alluded above to a limited way in which the development of the motorship may be of assistance to our merchant marine. I had in mind the conversion of a certain number of the Emergency Fleet Corporation's cargo vessels to Diesel drive.

This again is a matter of dollars and cents. At present, with shipyards abroad taking work at any price to keep their organizations going, motorships can be had at very low prices; at less prices, probably, than such vessels are intrinsically worth. When the situation again becomes normal, it should be possible, if the hulls are sold low enough, to fit them out with Diesel drive and sell them at a fair profit, to the extent that there is a demand for this class of cargo carriers. The operating differential, however, would remain, as compared to foreign motor vessels.

I am very much in favor of doing this as quickly and as far as circumstances seem to allow. It would be a great misfortune, however, if in carrying out this program, we were to allow ourselves to cherish any illusions as to our having found a solution of the problems confronting our merchant marine. The real trouble and the cure I have, perhaps somewhat crudely, pointed out.

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Competition in Overseas Shipping Must Be Met By Using More Efficient Ships and Propelling Machinery

By A. S. Hebble, Superintending Engineer, Southern Pacific Company, Atlantic Steamship Lines

IF we are to keep pace with our competitors in the ocean carrying trade of the world, we must meet them with efficient ships capably manned and well adapted to the trade conditions in which they are engaged. It requires but little study to see that this can only be accomplished by the construction of modern motorships on account of their low fuel consumption and long steaming radius in comparison with steam driven ships.

There are approximately two million tons of motorships in service and under construction. Having in mind that a very small portion of this is under the American flag, it is obvious that the motorship is finding great favor with our competitors and that unless we expect to see our flag disappearing from the seas we must resort to the most efficient type of both ship and propelling machinery.

Motorships are most advantageous on long voyages on account of their ability to carry a sufficient amount of fuel for a long return voyage. This enables the owner to buy his fuel at cost where the most advantageous prices are obtainable. They also have an advantage in that they consume less fuel per day and consequently carry less weight of fuel for a given voyage which results in increasing the deadweight and thereby adding to the earnings by being able to carry more cargo.

It is to be regretted that the cost of motor propelling machinery is greater than steam propelling machinery. This results in increased depreciation, interest and insurance charges. This is a condition however that must be met by the Diesel engine manufacturer. The cost of Diesel engine construction could be materially reduced through standardization and by putting Diesel engine construction on a manufacturing instead of a building basis as is now the case.

Properly designed motorships, with reasonable care and when operated with suitable fuel and lubricating oils, are operating consistently and economically as is shown by numerous records now available.

Legislation Should Be Enacted Making the Shipping Board Loan Fund Available for the Conversion of Existing Tonnage into Motorships

By Lewis R. Ford, Manager, Diesel Engineering Department, Morse Dry Dock and Repair Company

THE present disturbed condition of international credit and exchange has not only reduced the volume of marine business and curtailed the profit possibilities in ship operation but has also accentuated the handicap imposed on American ship operators by the difference in cost in foreign countries and the United States of all items entering into operating expense.

It is only by the application of a high degree of professional skill and business acumen that the American shipowner, thus handicapped, can operate steamers in competition with foreign vessels of the same type, but the situation becomes most acute when these steamers must compete against the rapidly growing fleet of economical foreign motorships. The establishment of an American motorship fleet is the obvious way out of this situation, but the great difference between the construction cost of new hulls in the United States and in foreign countries seems to prohibit the production of new tonnage in this country. It is possible, however, to put high class motorship tonnage afloat at a very low cost per ton by utilizing the several hundred good Shipping Board hulls that are available for purchase at a nominal price. Careful investigation has definitely developed the fact that such hulls can be purchased, converted and put into service at a cost of $40 to $50 per deadweight ton, depending on the completeness of conversion.

Only a few such conversions are now being made because under present conditions, financing a conversion project of any magnitude is almost impossible. If ship bonds and mortgages could be distributed to investors throughout the whole country as readily as similar railroad securities, few banks would hesitate to lend financial assistance to the numerous firms and individuals who are eager to make Diesel conversions. Unfortunately the American investor does not take kindly to marine securities.

It seems then that the most practical step toward improving the efficiency of our merchant marine as a competitive factor in the world's commerce is to unlock the loan fund of the Shipping Board and make it available for Diesel conversion purposes. This loan fund was created by Congress about two years ago to encourage private interests to build new ships but during the two year period that the fund has been available, only two new Diesel ships have been built with its aid, and these were of a very special type to which the conversion method is not applicable.

Every person with the interest of the American merchant marine at heart should use every effort to demonstrate to our national legislators, individually and as a body, the wisdom of immediately passing an enabling act that will permit the Shipping Board to lend money out of its present loan fund for converting existing steamers to Diesel drive as well as for building new ships.

Steady Increase in Tonnage of Sea-going Motorships

THE world tonnage of full-powered ocean-going motor ships (2,000 gross tons and over) aggregated nearly 1,000,000 tons on June 30, 1923—an increase of about 4 percent over the total on June 30, 1922, according to a study by B. V. York of the Transportation Division of the Department of Commerce. Vessels of British, Danish, and American nationality show a slight decrease, compared with the 1922 figure. Germany has shown the most rapid increase in tonnage. The three Scandinavian countries, however, have almost equal amounts.

Motorships of 5,000 gross tons and over increased 10 percent, amounting to 664,735 gross tons—two-thirds of the total. Countries owning vessels of this class maintain almost the same relative position as under the 2,000 ton classification.

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Herbert Hoover

Honorable Herbert Hoover, Secretary of Commerce, will open the American Marine Congress in New York on November 8.

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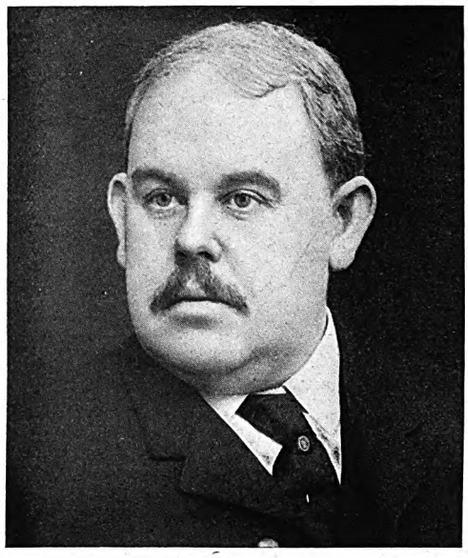
Colonel E. A. Simmons
Chairman Central Committee



Walter M. McFarland
Chairman Administrative Committee

Great Congress to Feature Marine Week of 1923

Marine Congress, Conventions and Exposition to Play Important Part in Determining Future of American Merchant Marine

MARINE Week of 1923, from November 5 to 10, in New York city, will bring together the varied interests of the country which directly or indirectly depend upon shipping in the conduct of their affairs. The Marine Congress to be held at the Waldorf-Astoria during this week has as its primary object the co-ordination of these interests into a body through whose deliberations it is hoped will be found a basis upon which the American merchant marine can be operated in an economically satisfactory manner and in a way to increase the competitive capacity of American ships.

The Congress is being held on the invitation of the American Marine Association whose members are convinced that American shipping can best be served by the combined efforts of the representatives of the marine industry and of all allied industries directly or remotely interested in water transportation. The result is that practically every section of the United States is to be represented by delegates from 97 organizations including chambers of commerce, port authorities, farm organizations and representatives of the various industries engaged in manufacturing for export and the like.

The organization of this national movement has been in the hands of an administrative committee, and a central committee supported by twenty sub-committees which have been instrumental in developing the policies upon which the congress will function.

Purpose of the Congress

No general policy has been decided upon by the committees, but they are asking the co-operation of all groups and classes of people interested in shipping to assist in developing a program during the congress that will be generally satisfactory to all industries. With such a program, having the support of the various organizations participating, it is felt that the Administration and the United States Congress will be greatly influenced in establishing a concrete national shipping policy. Party politics and matters of a controversial nature, however, are to be barred from the Marine Congress.

A number of lines of activity have been decided upon which tend to show the trend of thought and effort that will be put into this movement. All of these divisions of activity are aggressive in the defense of American shipping.

As stated in the preliminary committee reports of the Congress, the object shall be:

To urge, sponsor and recommend the modification or repeal of statutory restrictions or laws which tend to burden the world-wide competing capacity of American ships, but at the same time maintaining or establishing all necessary restrictions as pertain to the safety of passengers and crews, protection of goods and protection of rights, quarters and living standards of American crews.

To recommend the adoption of such new legislation as will increase the world-wide competitive capacity of American ships.

To recommend and urge such necessary modifications and changes in the steamship code as may be advantageous.

To develop and recommend such aid as will permit of an advantage in favor of building and repairing in American shipyards, with American labor and materials.

To recommend such standardization of construction and operation as will tend to reduce operating costs and increase competitive capacity.

To recommend and urge the repeal of such legislation as permits

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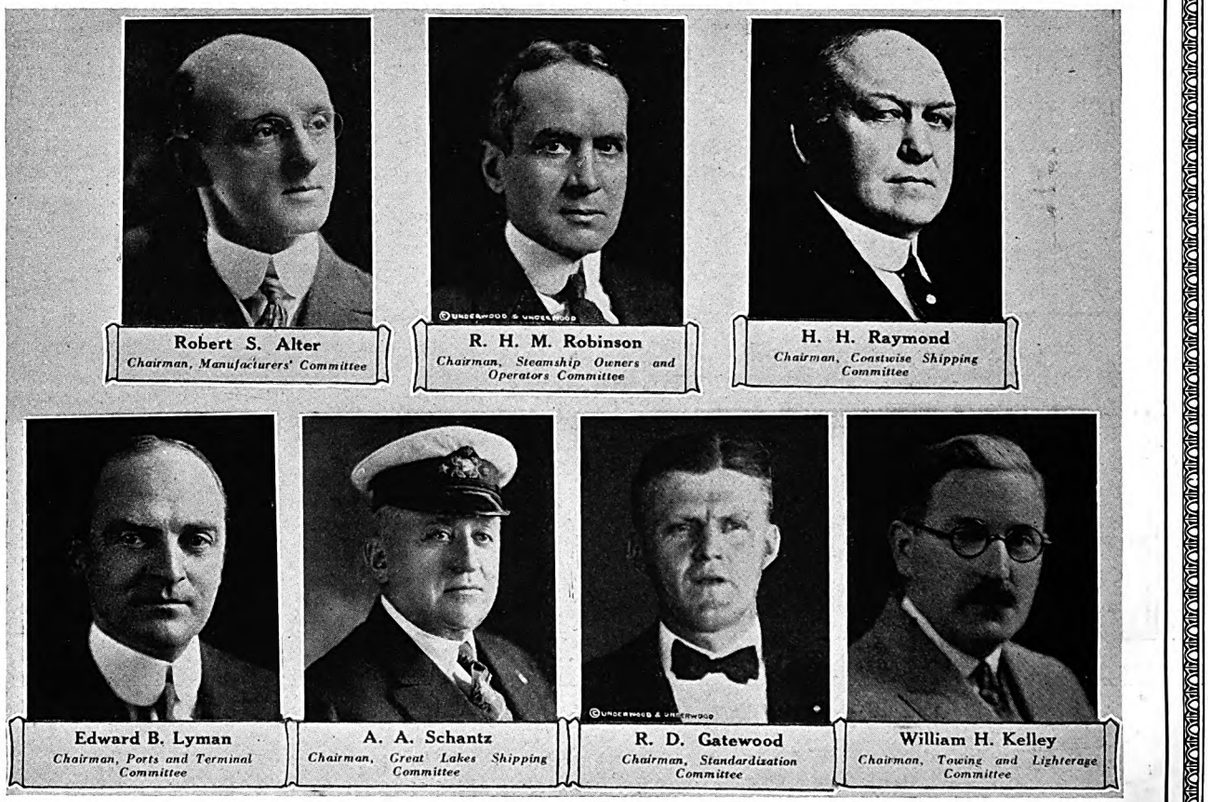

of government agencies (such as navy yards) competing with private enterprises (such as private shipyards).

To consider and make recommendations concerning government-owned ships or lines competing with private ownership.

To consider the advantage of reciprocal agreements with foreign lines on both outgoing and incoming shipments.

COMMITTEES OF ORGANIZATION

As noted above, the general plans for the development of the Congress have been in the hands of an administrative committee whose chairman is Walter M. McFarland, Babcock and Wilcox Company, New York, under the guidance of which the various sub-committees have been organized and put into operation as follows:

Central Committee, Edward A. Simmons, president American Marine Association, chairman.

Delaware River and Pennsylvania District Committee, Hon. J. Hampton Moore, Mayor of Philadelphia, honorary chairman.

Hampton Roads Committee, Capt. William H. Stayton, Baltimore Steamship Company, chairman.

South Atlantic States Committee, R. S. MacElwee, Commissioner Port of Charleston, S. C., chairman.

Mid-West and Mississippi River District Committee, Malcolm Stewart, Secretary Mid-West Farmers and Manufacturers' Conference, Cincinnati, chairman.

Great Lakes District Committee, Hon. Wm. E. Dever, Mayor of Chicago, honorary chairman.

Pacific Coast Committee, C. F. Gorman, traffic agent Port of Seattle, chairman.

Port of Greater New York, Hudson and State Waterways Committee, Charles H. Potter, president U. S. Ship Operators' Association, chairman.

Publicity Committee, W. A. Cather, Worthington Pump and Machinery Corporation, director.

Radio Committee, E. B. Mallory, Westinghouse Electric and Manufacturing Company, chairman.

Shipyards Committee, J. H. Mull, president Wm. Cramp & Sons Ship and Engine Building Company, Philadelphia, chairman.

Diesel Engine Committee, Rear Admiral Wm. S. Benson, Commissioner United States Shipping Board, Washington, D. C., chairman.

Manufacturers' Committee, Robert S. Alter, vice-president American Tool Works Company, Cincinnati, chairman.

Agricultural Committee, George M. Carey, Omaha Chamber of Commerce, chairman.

Steamship Owners and Operators' Committee, R. H. M. Robinson, United American Lines, chairman.

Coastwise Shipping Committee, H. H. Raymond, Clyde Steamship Company, New York, chairman.

Inland Waterways Committee, Hon. J. Hampton Moore, Mayor of Philadelphia, chairman.

Ports and Terminals Committee, Edw. B. Lyman, Passaic River Improvement Association, chairman.

Great Lakes Shipping Committee, A. A. Schantz, president Detroit and Cleveland Navigation Company, chairman.

Standardization Committee, Capt. R. D. Gatewood, United States Shipping Board, chairman.

Marine Insurance and Classification Committee, S. D. McComb, manager Marine Office of America, chairman.

Transportation Committee, Charles M. Muchnic, American Locomotive Sales Corporation, chairman.

Towing and Lighterage Committee, William H. Kelley, Flower Lighterage Company, chairman.

Banking Committee, Julian W. Potter, president The Coal & Iron National Bank, New York, chairman.

Exports Committee, Myron W. Robinson, president American Export Association, chairman.

Imports Committee, Frederic B. Shipley, Shipley-Hollis Company, chairman.

Entertainment Committee, Wm. Z. Gardner, president The Propeller Club of the Port of New York, chairman.

Exposition Committee, E. M. Roberts, Crane Packing Company, chairman.

Hotels Committee, Norris R. Sibley, McClave-Brooks Company, chairman.

Banquet and Entertainment Committee, H. W. Parsons, Powers Specialty Company, chairman.

Accommodations Committee, Chester M. Roe, New Jersey Asbestos Company, chairman.

The complete personnel of the Administrative Committee is as follows: Walter M. McFarland, chairman, Babcock and Wilcox Company; Frank J. Shipman, vice-chairman, The Texas Company; K. Warren Heinrich, secretary,

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Winthrop L. Marvin
Vice-Chairman Central Committee

K. Warren Heinrich
Secretary, Administrative Committee

Frank J. Shipman
Vice-Chairman, Administrative Committee

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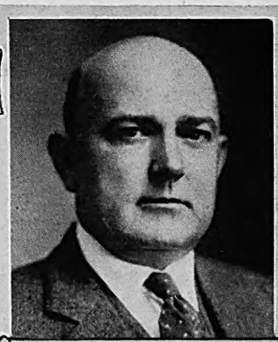
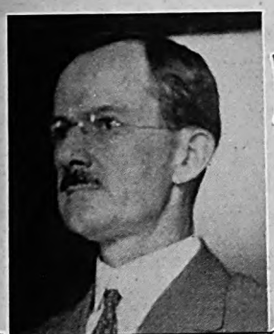


Jas. E. Plummer
Member, Administrative Committee



Hon. J. Hampton Moore
Honorary Chairman, Delaware River and Pennsylvania District Committee

W. P. Smith
District Chairman, Delaware River and Pennsylvania District Committee

William H. Stayton
Chairman, Hampton Roads Committee

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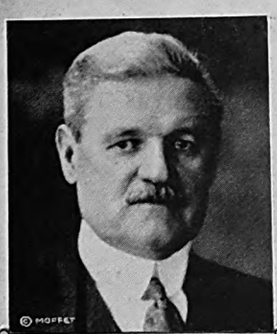
R. S. MacElwee
Chairman, South Atlantic States Committee



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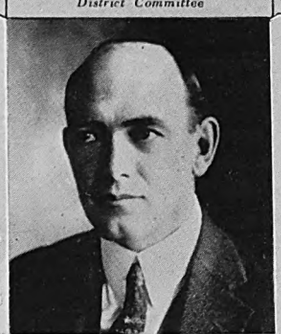
Hon. William E. Dever
Honorary Chairman, Great Lakes District Committee

F. C. Bradbury
District Chairman, Great Lakes District Committee



Charles H. Potter
Chairman, Port of Greater New York, Hudson and State Waterways Committee

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E. B. Mallory
Chairman, Radio Committee

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Hon. Theodore Roosevelt
Member Radio Committee

Admiral W. E. Reynolds
Member Radio Committee

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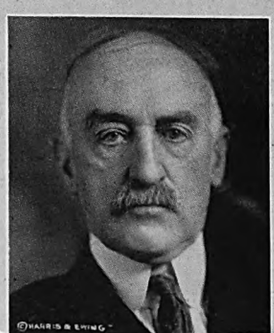
J. H. Mull
Chairman, Shipyards Committee



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William S. Benson
Chairman, Diesel Engine Committee

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American Marine Association; Charles F. Scott, General Electric Company; James Plummer, Newport News Shipbuilding and Dry Dock Company; Edward A. Colson, Babcock and Wilcox Company; Frank W. Sterling, The Sterling-Cooper Corporation; W. A. Cather, Worthington Pump and Machinery Corporation.

The complete personnel of the Central Committee is as follows: Edward A. Simmons, chairman, president American Marine Association; Winthrop L. Marvin, vice-chairman, vice-president American Steamship Owners' Association; K. Warren Heinrich, secretary American Marine Association; Hon. Herbert Hoover, Secretary of Commerce; Alfred Gilbert Smith, president American Steamship Owners' Association; Charles H. Potter, president U. S. Ship Operators' Association; John Dowd, vice-president Maritime Association of the Port of New York; Frederick A. Russell, president New York Tow Boat Exchange; H. A. Magoun, president Atlantic Coast Shipbuilders' Association; Homer Ferguson, president Council of American Shipbuilders; Capt. C. A. McAllister, Society of Naval Architects and Marine Engineers and vice-president American Bureau of Shipping; Capt. John F. Milliken, secretary Neptune Association; William Livingstone, president Lake Carriers' Association; Matthew Hale, president South Atlantic States Association; Myron W. Robinson, president American Manufacturers' Export Association; John E. Edgerton, National Association of Manufacturers; O. E. Bradfute, president American Farm Bureau Federation; E. E. Spafford, State Commander, American Legion.

The personnel of the various committees includes many prominent men from all sections of the country; for example, there are the mayors of six cities on the Delaware District Committee; the mayors of four cities on the Great Lakes District Committee; Admiral Benson is chairman of the Diesel Engine Committee; J. H. Mull, president of William Cramp and Sons Ship and Engine Building Company, is chairman of the Shipyards' Committee.

The Congress itself will convene on Thursday morning, November 8, and will hold morning and afternoon sessions on that day and Friday, November 9. All the sessions of the Congress will be open to any individuals interested in the matters being discussed.

The Honorable Herbert Hoover, Secretary of Commerce, will preside at the opening session of the Congress on Thursday morning, November 8, and the following sessions will be presided over by prominent individuals representing the major groups taking part.

Extensive Radio Program Planned

Coincident with the calling of the Congress it is planned to have sixteen or eighteen of the principal high power broadcasting stations distributed over the country take part in a general program prepared and directed by the radio committee.

To disseminate the thoughts and opinions of the leaders in various industries, associations and other institutions composing the Congress, radio will be used for the first time in an organized nation-wide program.

E. B. Mallory, chairman of the radio section of the Associated Manufacturers of Electrical Supplies, one of the seventy-eight national organizations participating in and endorsing the Congress is chairman of the radio committee of the Congress. To insure the successful and broad dissemination of an adequate knowledge of the needs of the nation, prominent Government and industrial executives are contributing their support and effort toward the success of the plan by serving as members of the radio committee. The membership of this committee includes:

Hon. Herbert Hoover, Secretary of Commerce.
General Pershing, U. S. A.
Theodore Rosevelt, Assistant Secretary of the Navy.
Admiral Benson, United States Shipping Board.
Rear Admiral Reynolds, United States Coast Guard.
A. H. Griswold, vice-president, American Telephone and Telegraph Company.
Major General Harbord, president, Radio Corporation of America.
H. P. Davis, vice-president, Westinghouse Electric and Manufacturing Company.
J. G. Barry, vice-president, General Electric Company.
Powell Crosley, Jr., president, Precision Equipment Company.
Eugene McDonald, president, Chicago Radio Laboratory.

and others of prominence.

The chairman has appointed subcommittees of the general committee in charge of programs, broadcasting stations and publicity, and sectional committees in each broadcasting center to have immediate charge of the activities at those points, and plans are rapidly being formed to use radio for the first time as a means of disseminating knowledge to the entire nation.

Marine Conventions During the Week

The nation-wide interest created in the Marine Congress will undoubtedly bring every man of importance in the shipbuilding and operating industries to New York during Marine Week and will add materially to the attendance of the annual meetings of various marine societies which will be held during the week.

The principal meeting will of course be that of the Society of Naval Architects and Marine Engineers, which will be the thirty-first general meeting of the Society. This year the meetings will be held in the Engineering Societies building, 29 West 39th street, on Thursday and Friday, November 8 and 9. Professional sessions will begin at 10 A. M each day.

The program of the meetings was published on page 590 of our October issue.

During the week the American Steamship Owners' Association, the United States Ship Operators' Association and the Atlantic Coast Shipbuilders' Association will also hold meetings.

Marine Exposition

It is expected that the interest created in the Marine Congress will greatly influence the success of the Marine Exposition which will be held November 5 to 10 at the Grand Central Palace under the auspices of the American Marine Association. The exposition will be open daily from 12:30 noon to 10:30 P. M. Various special attractions will be provided daily and the delegates to the Congress will find the exhibits of both general and educational interest. The two previous annual expositions held by the association showed an excellent attendance of those individuals connected with the marine industry. This year, with the greatly increased gathering of interests both directly and indirectly depending on shipping, the exposition, featuring as it does every phase of transportation by water, will be a greater success than ever.

Inspection Trips

Through the courtesy of the steamship owners and operators and the United States Government arrangements have been made to show the delegates to the Congress as much as possible of ships and shipping while they are in New York.

The United States Navy Department has ordered the U. S. S. *Colorado*, the latest super-dreadnought of the Navy, to New York to be open for inspection during this week. Numerous of the larger passenger vessels of our merchant marine will also be open for inspection as well as the piers and terminals about the port. Visiting delegates will be given an opportunity to inspect all types of merchant vessels, including cargo vessels, oil tankers and passenger ships. Included in this group of merchant vessels, will be the flag-

(*Continued on page 694*)

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Who's Who At the Exposition—

A Directory of Exhibiting Companies, Their Representatives, Products and Where to Find Them

Ajax Rope Company, Inc., 149 Broadway, New York.—Representatives: R. S. O. Lawson, M. L. Chapman, Chester Woodnorth, John White, Milton Mintzer, Russell Robb, Benjamin C. Hill, Norman Rounds. Booth 44.

Akimoff Propeller Company, Harrison Building, Philadelphia, Pa.—Diagrams, photographs and models of propellers, all built upon the "circulation" theory. Representatives: N. W. Akimoff, Dr. S. E. Slocum. Booth 67-B.

American Brass Company, Waterbury, Conn.—General copper and brass products for marine work; Admiralty condenser tubes; tobin bronze rods and shafting. Representative: L. B. Comstock. Booth 90.

American Car & Foundry Company, 165 Broadway, New York.—Berwick electric metal heaters. Representatives: F. C. Cheston, W. M. Earl, D. B. Wallace. Part of Booth 85.

American Steel Foundries, Chicago, Ill.—Booth 52.

Asbestolith Manufacturing Company, 1 Madison avenue, New York.—Samples of flooring. Representatives: R. C. Burnside, Miss B. V. Ross. Booth 97.

Ashton Valve Company, 161-179 First street, Cambridge 41, Boston, Mass.—Main boiler pop safety valves; smaller pop safety valves and relief valves; pressure and vacuum gages, gage and boiler testing outfits and large size marine whistles. Representatives: C. W. Buckelew, C. W. Ulrick, C. D. Motheral. Part of Booths 18 and 19.

Babcock & Wilcox Company, 85 Liberty street, New York.—Full size sectional model of Babcock & Wilcox 4-inch tube boiler; various boiler valves and fittings; sections of boiler headers; a working exhibit of the concentration salinity indicator; full size model of various Babcock & Wilcox design oil burners, among which will be the latest type oil burner, namely, the "Mayflower"; new boiler water testing outfit which will include a test for alkalinity. Representatives: C. W. Middleton, J. H. King, George H. Daniels, John Coleman, A. Ross Mackay, James Graham, Edw. A. Colson. Booths 76 and 77.

Beaver Tile, Inc., 442 West 42nd street, New York.—Beaver cork composition tile, a deck covering for all passenger accommodations and a new deck covering for steel decks to be used as a basis for other materials; Linomosaics, a new craft in decorative wall panels. Representative: A. N. Newell. Booth 11.

Bethlehem Shipbuilding Corporation, Ltd., Bethlehem, Pa.—Standard line of Bethlehem-Dahl oil burners with assembled unit of heaters and pumps; burner will be shown in operation using light oil and water; several Bethlehem-Weir pumps, including a turbo feed pump and a reciprocating pump in operation; also a new direction indicator developed by the Union Iron Works plant of the company in connection with engine room telegraphs. Representatives: A. W. Christian, G. A. Richardson, G. E. Laurence, G. W. Grove and F. K. Steinrock. Booth 68.

Briggs Engineering Works, 227 24th street, Brooklyn, N. Y.—"Burwell" fuel oil pumping and heating set, air register, oil burner, duplex strainers. Representatives: W. E. Yandell, C. N. Wheeler, H. M. Kuppinger, H. B. Patterson. Booth 104.

Brown Instrument Company, 50 Church street, New York.—Pyrometers, indicating and recording; recording thermometers and pressure gages; draft gages; resistance thermometers; automatic temperature control and automatic signaling equipment; salinity meters for boiler feeds and evaporator measurements; electric CO_2 recorders; electric tachometers—indicating and recording. Representatives: G. W. Keller, A. E. Keeler, J. D. Andrews, E. Schneider, C. L. Simon, M. M. Watkins. Booth 65-B.

Brunswick-Kroeschell Company, New Brunswick, N. J.—Brunswick marine type direct-connected ammonia compressor. Representatives: William O. Whitney, William Carpender. Booth 93.

Burmeister & Wain, 27 Whitehall street, New York.—Representatives: S. M. Petersen, R. L. Larsen, H. C. Hallings. Booth 86.

The Coen Company, 50 Church street, New York.—Complete oil burning system piped up to show the different component parts ready for operation; new design "ELR" swing type air register firing front and burner set; also steel construction easy cleanable fuel oil heater; latest design type "A" burner with its self-seating holder; fuel oil strainers, also strainers especially adapted to Diesel engine work. Representatives: W. M. Wampler, G. H. Ord, H. B. Chamberlain, F. S. Harper, F. Hall. Booth 79.

J. A. Coffey Engineering Corporation, 1650 Broadway, New York.—Sample floor, miniature carfloat and photographs for exhibition. Representatives: Miss Adele Eckstein, C. H. Alexander, J. A. Coffey. Booth 12.

William Cramp and Sons Ship and Engine Building Company, Philadelphia, Pa.—Diesel engine, marine steam turbine, reduction gear, bronze castings. Representatives: W. P. Smith, C. D. Cramp, C. R. Peterson, J. C. Shaw. Booths 70 and 71.

Crane Company, 836 South Michigan avenue, Chicago, Ill.—Complete line of steel material for all pressures, 150 pounds working pressure to 3,000 pounds working pressure inclusive; complete line of steel material showing representative line of marine valves and fittings. Representatives: F. C. Bradbury, G. E. Barker. Booth 66.

Crane Packing Company, 53 Park place, New York.—A model condenser on which a continuous test will be made; entire line of packings for general marine work. Representatives: J. N. Walton, E. M. Roberts, C. W. Bryden. Booth 227.

The De Laval Separator Company, 165 Broadway, New York.—Three sizes of De Laval oil purifiers, Nos. 200, 300, 600, assembled complete; three purifier bowls, showing results of the process. Representatives: P. F. Miller, D. F. Miller, Allan Hopper, H. H. George, E. V. Mayhill, M. A. Monroe. Part of Booth 85.

Diamond Power Specialty Corporation, Detroit, Mich.—Diamond model B rear end soot blower for Scotch marine boilers, model BBM rear end front operated blower for Scotch marine boilers, model G 2 M revolving soot blower for marine watertube boilers, Valve-in-Head soot blowers for marine watertube boilers, model G 2 soot blowers for watertube boilers. Representatives: L. W. Nones, Robert June. Booth 74.

Diehl Manufacturing Company, Elizabeth, N. J.—Ventilation blowers, motor driven; desk fans, ceiling fans, exhaust fans and motors for general shipboard use. Representatives: M. W. Buchanan, W. E. Fey, J. R. Marvin, J. G. Levy. Booth 31.

O. M. Edwards Company, Inc., Syracuse, N. Y.—Marine sash or glass balancing device. Representatives: J. J. Edwards, A. J. Horgan. Booth 15.

Electric Storage Battery Company, Philadelphia, Pa.—Wireless battery for service on shipboard; radio batteries—both A and B—such as would be used for the reception of broadcast entertainments in homes or aboard private yachts; a gigantic submarine cell; a "shadow-box" showing an oil painting of an industrial scene, calling attention to the manner in which Exide-Ironclad batteries are serving the shipping industry; batteries used for ignition and yacht lighting are also shown. Representatives: E. F. Kullberg, A. C. Ferdon, R. E. Kearney, J. W. Weight, J. Carey, M. T. Ford, J. L. Fuller. Booth 31.

Electro Sun Company, Inc., 161 Washington street, New York.—Phases of blue and black printing and photo-printing that will interest marine men; display of Lefax system. Representative: A. L. Weil. Booth 253.

Falk Corporation, Milwaukee, Wis.—Flexible couplings;

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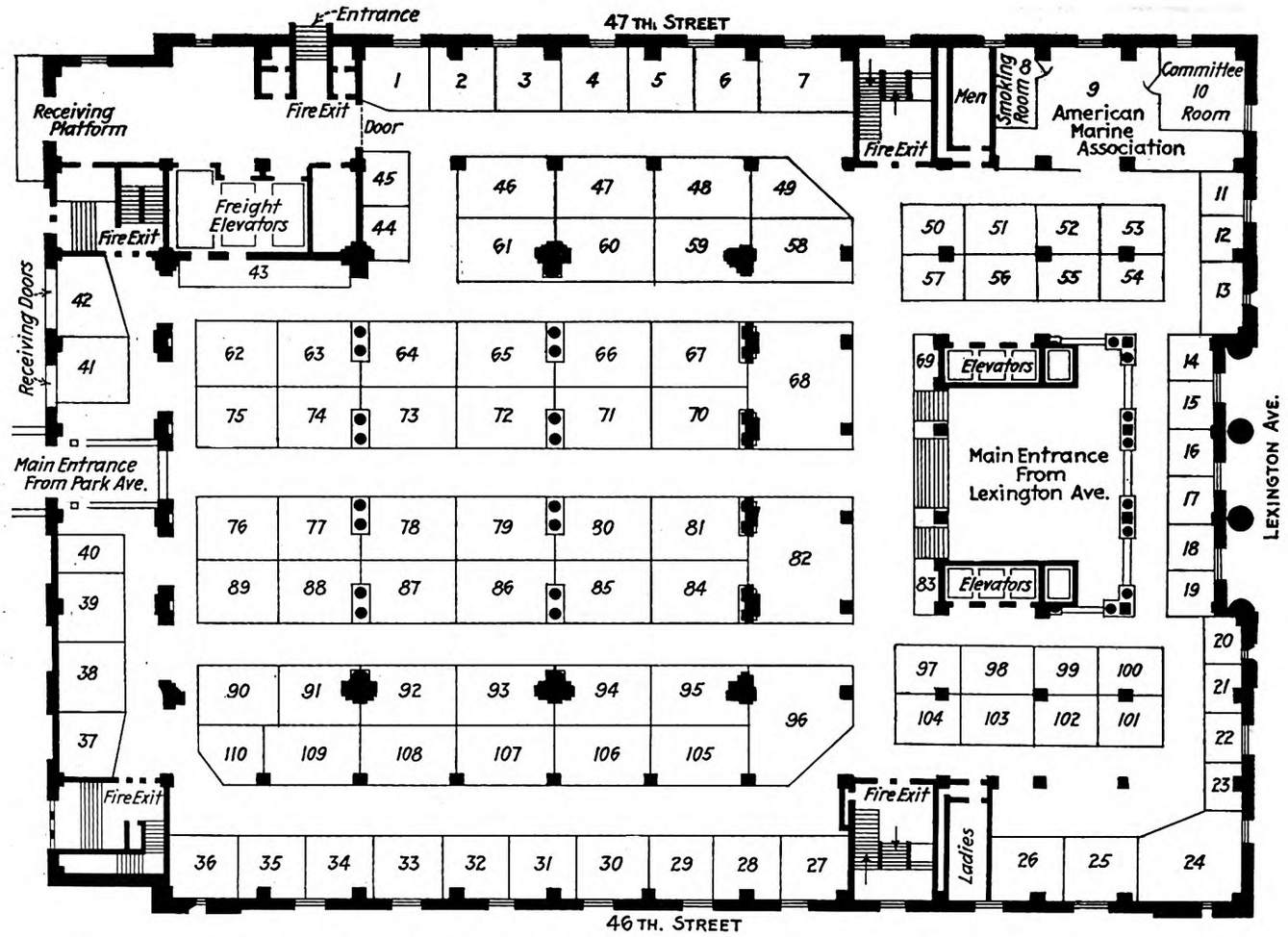

Main Floor of Marine Exposition, Grand Central Pal ace, Lexington Avenue and 46th Street, New York City

small double reduction gear unit; moving pictures of geared oil engines and photographs of marine gear installations. Representatives: M. P. Fillingham, W. O. Beyer. Booth 87.

L. W. Ferdinand Company, 152 Kneeland street, Boston, Mass.—Jeffery's marine glue; Linoleum and tile cements; Century products. Representatives: August Schlueter, L. W. Ferdinand and L. C. Herring. Booth 228.

Fire Detecting Wire Corporation, 2 West 45th street, New York.—Four standard control panels in operation complete with fire stations, gongs, etc. Representatives: W. H. Garrison, C. Van Zandt, S. C. Zabriskie. Booth 335-336.

Foster Marine Boiler Corporation, 111 Broadway, New York.—Complete detail parts of Foster marine superheaters and a section of the new Foster marine economizer. Representatives: H. W. Parsons, R. L. Lovell, J. J. Nelis. Booth 101.

General Carbonic Company, 542 Fifth avenue, New York.—Cylinders containing CO_2 gas so connected with fire-detector as to demonstrate the effectiveness of carbonic gas as a fire extinguisher aboard vessels. This method is known throughout marine circles as the Lux System. Representatives: A. McKinny, H. R. Minor, C. W. Wardell. Booth 49.

General Electric Company, Schenectady, N. Y.—Ten kilowatt steam engine driven generating set with a portion of the steam chest and cylinder removed, and glass doors for the column to show the operation of the reciprocating parts; also a switchboard for this unit which will be in operation; two 18-inch searchlights, one hand control, the other electrically controlled, will be in operation; one COM type direct-current motor for use in connection with deck auxiliaries direct-connected to a shoe type solenoid brake for use with deck machinery, the motor to be operated and controlled through a C-410-A type master controller with suitable resistance; in addition, a separate motor bearing head will be sectionalized to show the method of lubricating the journal, and the manner in which entering water is prevented from passing into the oil wells by suitably designed passages and chambers; automatic motor driven air compressor as used for cleaning electrical and other apparatus, for an emergency compressor on motorships, and for pneumatic tools used in drilling holes, beading and calking seams, scaling plates, etc.; RCM direct-current motor in operation; 32-volt 500-watt turbine-generator set designed especially to supply electric energy for the lighting of a headlight or searchlight on tugs or other vessels; the principles of Diesel engine electric drive as applied to the propulsion of various types of vessels will be shown in animated form in a manner that the non-technical visitor will readily understand the principles involved; 174-A drum type watertight controller; various charts giving interesting data on 322 ships equipped with marine geared turbines and 39 vessels having General Electric Company electric propulsion and control machinery. Representatives: L. W. Shugg and engineers of the Marine Department. Booths 3, 4, 5, 6.

B. F. Goodrich Rubber Company, Akron, Ohio.—Cutless bearings; sealing rings; mechanical rubber goods for the marine industry. Representatives: C. F. Sherwood, L. Q. Moffitt, W. A. Whitenack. Half of Booth 84.

Griscom-Russell Company, 90 West Street, New York.—Representative examples of line of marine auxiliaries; Reilly submerged type evaporator, feed water heater assembled with complete fittings in both single and two-pass types, feed water filter and grease extractor of the pressure type and fuel oil heaters both of the Reilly coil design and the more recent straight tube type; sectional model of multiwhirl oil cooler which has been used so extensively for the cooling of lubricating oil for geared turbines, turbo electric and Diesel engine installations; marine fittings such as automatic float controls, special valves, separators, etc.; new G-R low pressure expansion joint. Representatives: R. Colston, B. P. Collings. Booth 60.

Hill Rotors, Inc., 42 Broadway, New York.—Air compressors, liquid pumps, vacuum pumps, combined liquid and vacuum pumps. Representatives: Myron F. Hill, Francis A. Hill, Walter G. Thomson, T. H. Wolf. Booth 252.

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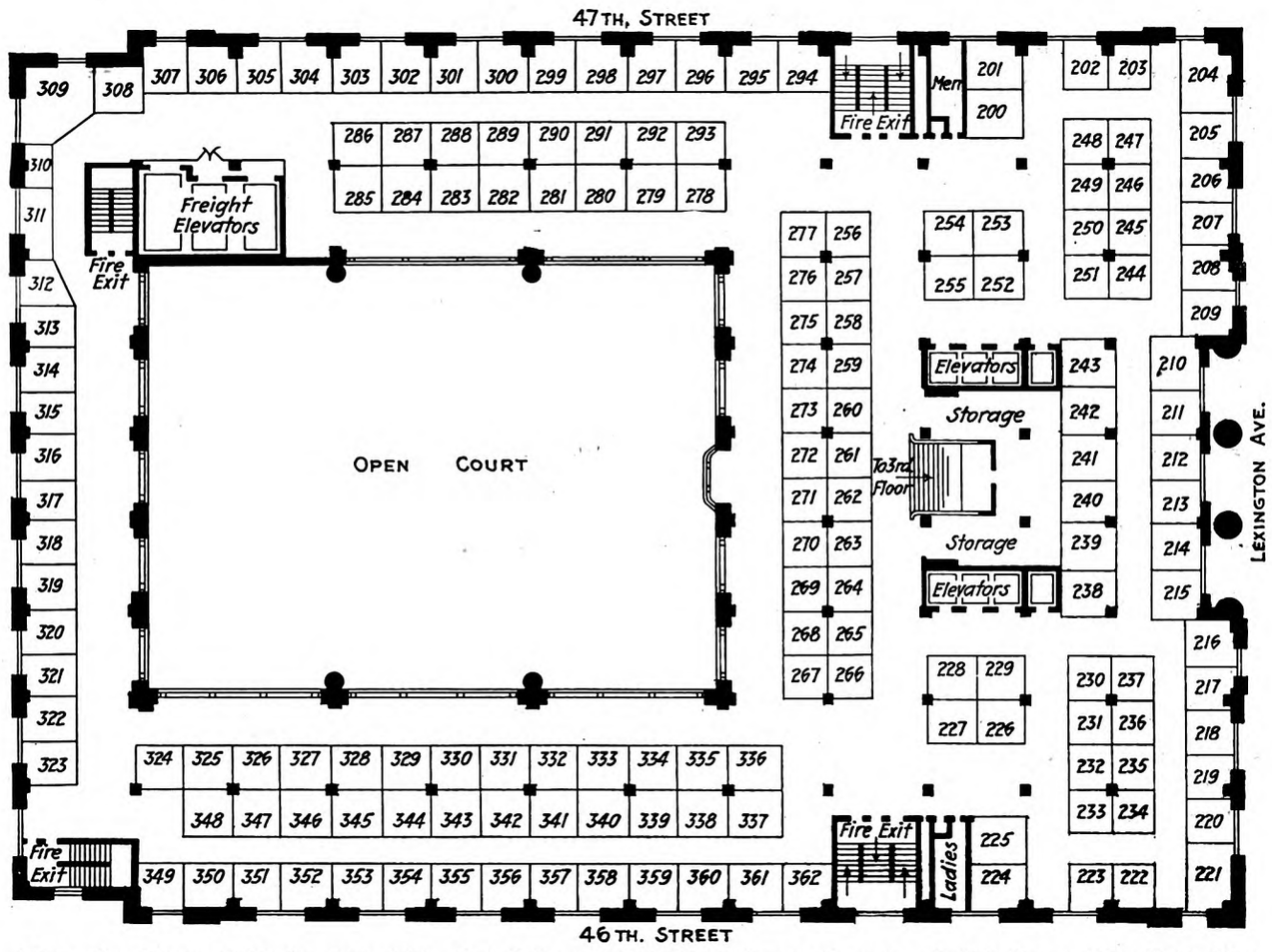

Mezzanine Floor of Marine Exposition, Grand Central Palace, Lexington Avenue and 46th Street, New York City

Hooven-Owens-Rentschler Company, Hamilton, Ohio.—Views of the plant and Hamilton engines and parts of Hamilton equipment. Representatives: Henrik Greger, H. A. Smith, F. L. Hummer. Booth 17.

Ingersoll-Rand Company, 11 Broadway, New York.—Photographs of semi-Diesel engine installations on board ship as well as of marine oil engines, machinery and other equipment for shipyard uses. Literature will also be distributed descriptive of various products of the company. Representatives: L. D. Albin, F. W. O'Neil, D. C. Keefe, R. W. Douglass, R. R. Womack, L. V. Armstrong, G. W. Morrison, F. K. Armstrong, J. W. Morton, P. T. Brostrom, J. V. Mossman, H. R. Fee, H. G. Erb. Booth 47.

Journal of Commerce and Commercial Bulletin, 32 Broadway, New York.—Representative: H. V. S. Negus. Booth 50.

Walter Kidde & Company, 90 West Street, New York.—Rich system for smoke detection; Lux system for fire extinguishing; electro-vapour radiator for electric heating. Representatives: W. H. Freygang, A. M. Doxsey, G. Crosby Hiss. Booth 49.

Knudsen Motor Corporation, 30 Church Street, New York.—120 horsepower 2 cycle engine, full Diesel type; 50 horsepower 2 cycle engine, full Diesel type. Representatives: M. Knudsen, J. B. Tait, C. Knutson, J. R. Pitbladdo, Capt. P. P. Songdahl, F. G. Schneeberg, Jr., J. W. Barnett, A. Doll, G. Allardyce. Booth 81.

Lunkenheimer Company, Cincinnati, Ohio.—Complete and interesting display of both high and low pressure valves, boiler mountings, whistles and similar high grade engineering appliances; steel, bronze and iron globe angle, check and gate valves; water columns, water gages, gage cocks, blow-off valves, safety non-return stop valves, etc. Representative: W. Reynolds. Booth 95.

McIntosh & Seymour Corporation, Auburn, N. Y.—Photographic enlargement of largest engine, type 6-C-56. Representative: B. P. Flint. Booth 59.

Marine Decking & Supply Company, 116 North Delaware avenue, Philadelphia, Pa.—Madesco tackle blocks; American Lit-O-Sil-O decking; American Lit-O-Sil-O flooring; several paintings showing American Lit-O-Sil-O. Representatives: G. W. Selby, W. L. Peebles, E. P. Jewell. Booth 110.

Marine Engineering and Shipping Age, 30 Church Street, New York.—MARINE ENGINEERING AND SHIPPING AGE, *The Boiler Maker,* "Shipbuilding Cyclopedia," "Practical Marine Engineering," "Laying Out for Boiler Makers" and marine books. Representatives: Colonel E. A. Simmons, Henry Lee, C. R. Mills, R. V. Wright, George Slate, James Swan, H. H. Brown, L. S. Blodgett, W. Z. Gardner, H. B. Bolander, J. A. Miller, B. L. Dombrowski, R. F. Duysters, N. C. B. Fowles, J. E. Anderson, H. E. McCandless, R. W. Zinn, George Laxar, E. H. Allen, G. W. Stutt. Booths 94 and 106.

The Marine News, 26 Water Street, New York.—Booth 83.

The Marine Review, Cleveland, O.—Booth 30.

Morse Dry Dock & Repair Company, foot of 56th Street, Brooklyn, N. Y.—Photographs of plant and pictures covering not only the general run of straight ship repair work, but including important Diesel repair and oil burning installations as well. A unique working demonstration of the Morse fuel oil burning system will be in operation as well as a working model of certain new devices. Representatives: Frank Breyfogle, D. J. Irish, L. R. Ford, D. V. Stratton. Booth 72.

National Malleable Castings Company, Cleveland, O.—Complete line of anchor chain together with anchor and connecting shackles as well as swivels. Representatives: Benjamin Nields, Jr., W. C. Lewis, E. Sihler, E. E. Eyman, R. E. Valentine. Booth 57.

National Meter Company, 299 Broadway, New York.—Full line of oil and gasoline meters for marine purposes with special reference to meters for oil-burning equipment. Representatives: G. D. MacVeagh, J. J. Pirrung. Booth 14.

Natural Carbonic Gas Company, Newark, N. J.—Carbonic gas in steel cylinders. Representatives: P. E. Fay, T. P. Arnold. Booth 267.

New London Ship & Engine Company, Groton, Conn.—One 180-horsepower engine. Booth 75.

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Newport News Shipbuilding & Dry Dock Company, Newport News, Va.—Representatives: L. D. Pickering, F. L. Hoffman, R. H. Lee. Booth 32.

Northern Fire Apparatus Company, Minneapolis, Minn.—Electric driven fuel oil pump (high pressure), electric driven fuel oil pump (high vacuum) in operation; boiler feed pump; fire and bilge pump. Representative: J. A. Hense. Booth 54.

Pantasote Company, 11 Broadway, New York.—Vehisote panel and tile boards for bulkheads, ceilings, wainscoting, partitions, etc.; Pantasote upholstery and curtain materials; Russialoid upholstery. Representative: W. A. Lake. Booth 28.

Peabody Engineering Corporation, 110 East 42nd Street, New York.—Double-ported hinged type register fitted with Peabody-Fisher wide range mechanical burners; the double-ported type of register was especially designed for high capacity on low drafts. Representatives: J. P. Leask, E. B. Sadtler, S. T. Warner, R. C. Vroom. Booth 13.

Port of Charleston, Charleston, S. C.—Booth 255.

Power Specialty Company, 111 Broadway, New York.—Complete detail parts of Foster marine superheaters and a section of the new Foster marine economizer. Representatives: H. W. Parsons, R. L. Lovell, J. J. Nelis. Booth 101.

Pneumercator Company, 40 Flatbush Avenue Extension, Brooklyn, N. Y.—Pneumercator tank gages, ship's draft gages and distant boiler gage glass. Representatives: W. Thomas, Calvin J. Wicks. Booth 36.

Radio Corporation of America, New York.—Booth 48.

The Roto Company, Hartford, Conn.—Roto tube cleaners for boilers, both watertube and Scotch marine; condensers, both surface and double-pipe; evaporators, heaters, etc., together with Paragon header scrapers and cap cleaning machines. Representatives: Messrs. Doherty, Van Nortwick and Kelley. Booth 266.

Row & Davis Engineers, Inc., 90 West Street, New York.—RanD system for reliquidizing fuel oil without the aid of steam coils in ships' inner-bottom tanks; improved Paracoil fuel oil heater; standard Paracoil feed water heater; Paracoil evaporator, fresh water still; R & D steam trap, grease extractor. Representatives: Messrs. Row, Davis and Thompson; also Messrs. Smith and Young. Booth 63.

Rubber-All-Products Company, 821 Broadway, New York.—Rubber-All waterproof suit; the exhibit will include, "The Acid Test," which will show by actual demonstration the indestructible waterproof material used in the manufacture of Rubber-All suits. Representative: H. S. Dube. Booth 69.

Scovill Manufacturing Company, Waterbury, Conn.—Cup drawn Admiralty condenser tubing. Samples of corroded tubing, defective tubing and the best grade of material shown under the microscope. Samples of brass mill products, such as sheet, rod, wire and seamless tubing as well as manufactured articles made from raw materials. Representatives: E. H. Callanan, P. Davidson, C. A. Gleason, C. B. Kerr, Jr., G. T. Power, L. R. Root, M. N. Rose, C. W. Snowman, A. M. Southall, M. L. Sperry, Jr., W. E. Twining, L. L. Williams. Booth 58.

Sperry Gyroscope Company, Manhattan Bridge Plaza, Brooklyn, N. Y.—Navigational instruments; two complete MK VI Gyro compass equipments—a Gyro-pilot, the automatic helmsman, 5 of which during the last two years have efficiently steered five ships over 150,000 miles; improved helm angle indicator system, improved ship's log system; improved revolution indicator system. Sperry 18-inch high intensity Duralumin marine searchlight; 36-inch high intensity searchlight similar to the one installed on the *Leviathan* and as installed on the 5 Night Air Mail Fields. Gyroship's stabilizer model in operation. Representatives: R. B. Lea, Messrs. Whitaker, Jobson, Sparling, Patterson, Bates and Hodgman. Booths, 20, 21, 22, 23.

Shipley Construction and Supply Company, 42nd Street and 2nd Avenue, Brooklyn, N. Y.—Refrigerating machinery and parts. Representatives: R. G. Land, E. Phillips. Booth 35.

The Sterling-Cooper Corporation, 318 West 39th Street, New York.—Technical and commercial marine books; Sterling's Marine Catalog. Representatives: F. W. Sterling, T. G. Newbery. Booth 67-A.

B. F. Sturtevant Company, Hyde Park, Boston, Mass.—Stationary type vacuum cleaner; portable vacuum cleaner; individual oil burner turbine blower; vertical single engine; gasolene engine-driven generating set; turbine for auxiliary drive; various size ventilation fans both motor and turbine driven; 3,000-foot ventilation heater. Representatives: E. B. Williams, E. L. Moran, W. A. Finnegan. Booth 107.

Submarine Signal Company, 160 State Street, Boston 9, Mass.—Submarine bell; submarine oscillator; standard submarine signal receiving apparatus; new portable submarine direction finder; new submarine sounder; stereomotograph pictures showing activities of the company in making navigation safe. Representatives: H. J. W. Fay, E. P. Howe, E. F. Irwin. Booth 256.

Sun Shipbuilding Company, Chester, Pa.—Large size model oil tanker *Atlantic Sun;* photographs of ships built and various views of shipyard and shops; photographs of Diesel engines built at yard. Representative: T. T. Borden. Booth 78.

The Superheater Company, 17 East 42nd Street, New York.—Model of the Elesco firetube superheater as applied to the Scotch marine type boiler; model of the Elesco superheater as applied to marine watertube boiler and boilers used on Mississippi river boats; steam pyrometers for measuring temperatures; engineering data and literature. Representatives: H. B. Oatley, G. E. Ryder, C. A. Brandt, G. E. Kershaw, W. McLintock, G. L. Moore, J. A. Barnes. Booth 73.

The Texas Company, 17 Battery Place, New York.—Miniature oil derrick and full line of marine lubricants. Representatives: F. J. Shipman, H. W. Schilling, E. A. Lobb, A. St. James, G. C. Bartlum, J. L. Ward. Booth 35.

P. S. Thorsen & Company, Inc., 81 Coffey Street, Brooklyn, N. Y.—Complete line of insulation, including practical demonstrations of the saving to be made by proper insulation. Representatives: P. S. Thorsen, M. L. Bullard, R. S. Warner, W. Davies, T. Drydale, V. Menig. Booth 98.

W. & J. Tiebout Company, 118 Chambers Street, New York.—Standard line of ship joiner hardware with various new patterns and designs that have been brought out recently. Representatives: J. Tiebout, Jr., G. V. Carlin, Chas. H. Schult, F. J. Morrisey, J. D. Gillespie. Booth 27.

Todd Shipyards Corporation, 25 Broadway, New York.—Todd twin pole arc welder; Todd oil burning galley range; Todd fuel oil burners for marine and land installation. Mr. Arnold L. Wernert, instructor for the "TODD" Oil Burner School, will be present during the entire period of the show and will give an outline of the course of instruction in oil burning. Representatives: Robert G. Payne, A. J. Holifield, J. A. H. Hood. Booths 92 and 108.

United States Department of Commerce, Washington, D. C.—Booths 214 to 225, inclusive, and 230 to 240, inclusive.

United States Department of Public Health, Division of Marine Hospitals, Washington, D. C.—Booths 316 to 323, inclusive.

United States Navy, Washington, D. C.—Booths 201 to 213, inclusive, and 241 to 251, inclusive.

Valentine & Company, 456 Fourth Avenue, New York.—Table top testing table; running water machine; Valspar varnish stains; demonstration of Valspar's waterproof qualities; panels of clear Valspar, Valspar varnish stains and Valspar enamels; color chart made up of glasses showing different shades of Valspar enamel; original painting by Lieut.-Com. Henry Reuterdahl, U. S. N. R., used in advertising the fact that Valspar was used on the *Leviathan*. Representatives: H. Pulsifer, D. Walker, deCamp Freeman. Booth 43.

Welin Davit and Boat Corporation, 305 Vernon avenue, Long Island City, N. Y.—Models of various types of Welin quadrant davits with lifeboats attached; samples of Permacote red lead. Representatives: H. F. Sailor, Walter J. Krolman, O. J. Slaght, Chas. White, R. E. Keppler. Booth 254.

Westinghouse Electric & Manufacturing Company, 165 Broadway, New York.—100 kilowatt turbine driven auxiliary power generating set; 1½ kilowatt turbine generator lighting unit; sectional bake oven; marine oscillating fan; intercooler type air ejector; Diesel engine generator model; pilot house control desk; marine controllers; marine motors; electric water heaters; engine circulating water pump. Representatives: G. H. Froebel, W. B. Barrett, C. C. MacMillan, R. E. Aldridge, W. E. Thau, H. C. Coleman, E. D. King, H. M. Southgate, B. H. Hamilton, C. F. Duffield, J. J. Brown, W. F. James, E. F. Clark, L. D. Howell, H. L. McCarter, P. A. Sensenig. Booths 82 and 83.

C. H. Wheeler Manufacturing Company, Lehigh and Sedgley Avenues, Philadelphia, Pa.—New type of Radojet air pump, designed for closed feed water systems; two small surface condensers combined in one unit arranged one between the first and second stage and one after the second stage; marine type condensate pumps; dynamometer; Radojet augmenter. Representatives: G. L. Kothny, C. Lang, J. J. Mullan, J. Dobson. Booth 7.

Worthington Pump & Machinery Corporation, 115 Broadway, New York.—Pumps; meters; 120 horsepower Diesel engine. Representatives: L. Katsenstein, W. A. Cather, I. W. Jackman, C. B. Humphrey, J. J. Morch. Booth 96.

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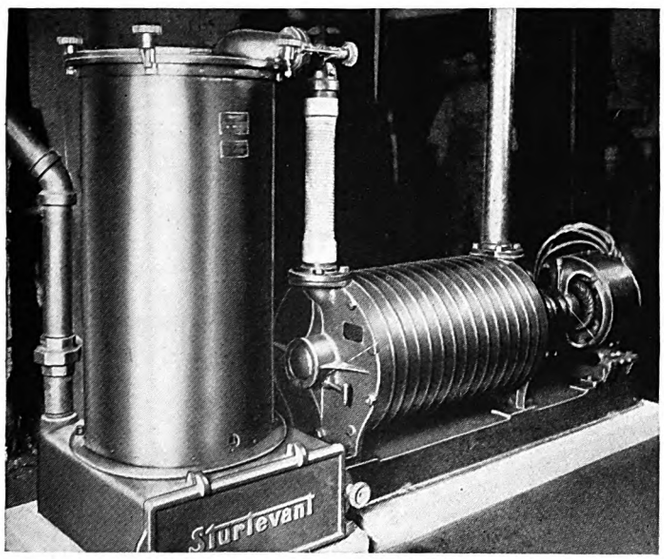
New and Interesting—

Marine Devices Described Below Will be Shown at the Marine Exposition This Year for the First Time

Vacuum Cleaner and Turbo Blower Developed by Sturtevant

TWO new pieces of equipment will be featured at the B. F. Sturtevant Company, Hyde Park, Boston, Mass., exhibit—the Type-E vacuum cleaner and the A-13 individual oil burner turbine blower. The Type-E cleaner is known as the horizontal type and is of the same general design as the larger size cleaners made by the company.

The vertical chamber is a dust collector. The fans which create the suction are in the horizontal section at the center. The air first passes through the collector and is thoroughly filtered before being exhausted. The dirt, therefore, cannot reach the fans or bearings and clogging or unbalancing of



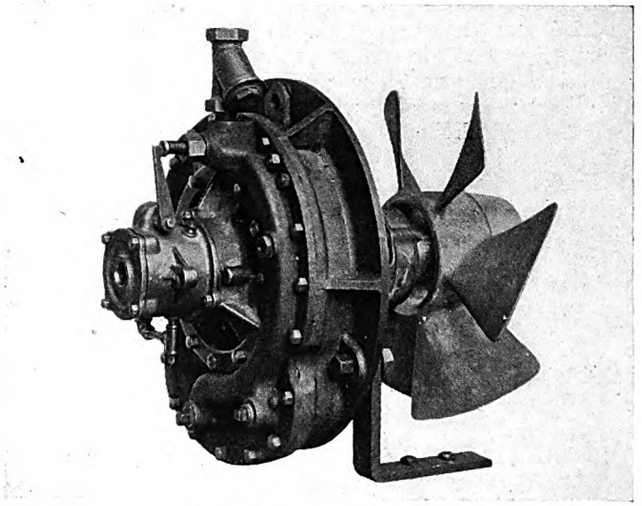
Horizontal Vacuum Cleaner Known at Type-E

the fans or injury to them is thus avoided. The bearings of the fan are automatically lubricated and arranged so that no grease can reach the dust bag. The dust bag is easily removable for cleaning or renewal.

This type of cleaner is made in seven sizes besides various other types of vertical and portable machines.

TURBO BLOWER

The A-13 turbo blower unit consists of a multi-velocity impulse steam turbine and a fan of the cast aluminum propeller type. The turbine bucket wheel is a solid forging with buckets milled into the rim. Because of the hollow shaft, the ball bearings are exceptionally large thereby assuring long life. Each gland is fitted with carbon packing which requires no lubrication or adjustment during its life. Convenient arrangements are made on the turbine casings for attachment of the oil burning apparatus.



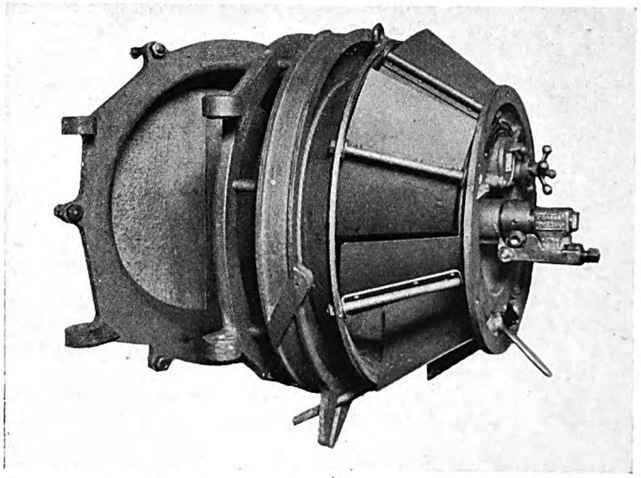
Size A-13 Blower Unit

The unit is fitted with a specially designed and patented governor of the speed limiting type which does not allow the turbine to exceed its safe operating speed at any pressure.

Double Ported Register Fitted with Wide Range Burner

AMONG the special equipment which the Peabody Engineering Corporation, New York city, will exhibit this year is a double-ported hinged type register fitted with Peabody-Fisher wide-range mechanical burners.

This register was especially designed to meet the needs of ships operating under natural draft with fairly low stacks.



Wide Range Mechanical Burner Assembled with Double Ported Horizontal Type Register

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This register is an adaptation of the standard Peabody air register and has an enlarged furnace opening and an auxiliary air port in place of the standard back plate.

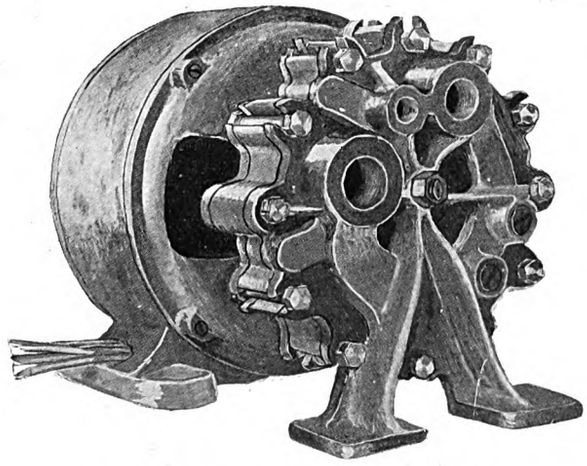
The amount of opening of the auxiliary port is controlled by means of a ring which is supported on three rollers. This ring opens and closes with a helical movement so that all chance of the ring sticking or becoming cocked is eliminated. The rotative movement of the ring is controlled by a crank actuated by a handle on the register front. The design shown in the accompanying illustration is for natural draft operation and is hinged so as to permit ready access to the furnace. This type of register has been in service on shipboard for some time and has given exceptional results.

This same type register is used in conjunction with the Howden heated air system and supplants the combination coal and oil front. The Hudson River Day Line steamer *DeWitt Clinton* is fitted with a complete installation of these registers, which have been used with great success during the season just passed.

For use with forced draft double front installation, the design is modified slightly, the hinges being fastened to the front plate, permitting the register to swing out of the double front. This design will be installed on the Day Line steamer *Alexander Hamilton* now being built.

New Principle Discovered in Pump and Compressor Rotor Design

WHAT is claimed to be a hitherto unknown principle of rotary motion as applied to pumps and compressors will be the main feature of the exhibit of Hill Rotors, Inc., New York city. It is claimed that the new Hill Rotors mechanical motion can handle pressures from 20 to 400 pounds at any speed up to 2,000 revolutions per minute with a satisfactory degree of efficiency. These rotors consist of



Hill Rotors Motor Compressor Unit

one inside the other; one has nine lobes or teeth and the other eight. The curves of these rotor lobes involve entirely new geometrical relations and open up an entirely unexplored mathematical field. They are such that they have a continuous pressure holding engagement between the high pressure port and the low pressure port.

The outer rotor drives the inner rotor and air or liquid in one of the spaces never slips back between the lobes into the next larger space behind it. Each space does its own compression and discharges independently of its neighbor. These rotors rotate on fixed centers, the inner rotor being eccentric to the outer so that they open a series of spaces on one side to receive the pumped fluid and close them to discharge it on the other side.

Due to the pressure holding engagement between the rotors and the positive mechanical action, pressure and volumetric efficiency are practically independent of the speed of rotation. The only factor to vary with the speed is the capacity.

On test a small paint spraying air compressor had a volumetric efficiency of over 90 percent at 50 pounds pressure. A small liquid pump had between 95 percent and 100 percent

Form of Rotors Developed for Pump and Compressor Service

volumetric efficiency on pressures up to 100 pounds. These pumps have attained pressures up to 370 pounds on air and 400 pounds on liquids. In both cases when attaining these pressures the power was shut off to save the piping.

Due to the fact that there is practically no clearance between the rotors, Hill rotors, it is claimed, will pull as perfect a vacuum as can be measured on a mercury column.

Where power efficiency is not of prime importance one Hill rotor pump can be made to handle liquids, air compression, or a vacuum.

In electric units there are only three moving parts, the inner rotor, the outer rotor, and the driving shaft which is direct connected to the motor.

Salinity Concentration Indicator—Oil Burner with Self-Contained Forced Draft

TWO new developments in apparatus made by the Babcock & Wilcox Company, New York, which will be shown at the Exposition this year, are a concentration salinity indicator and a mechanical atomizing oil burner known as the Mayflower design with a self-contained forced draft system.

The salinity indicator shows automatically and instantaneously an increase in the density of the water by showing various colored lights, a white light for 0.5 grain, a green light for 0.5 to 5 grains and a red light for a density over 5 grains. This is an especially valuable feature in connection with the evaporator room, as an instantaneous warning is given when the quality of the distillate changes, thus obviating the possibility of running poor water.

The signal light controller also keeps an accurate check on

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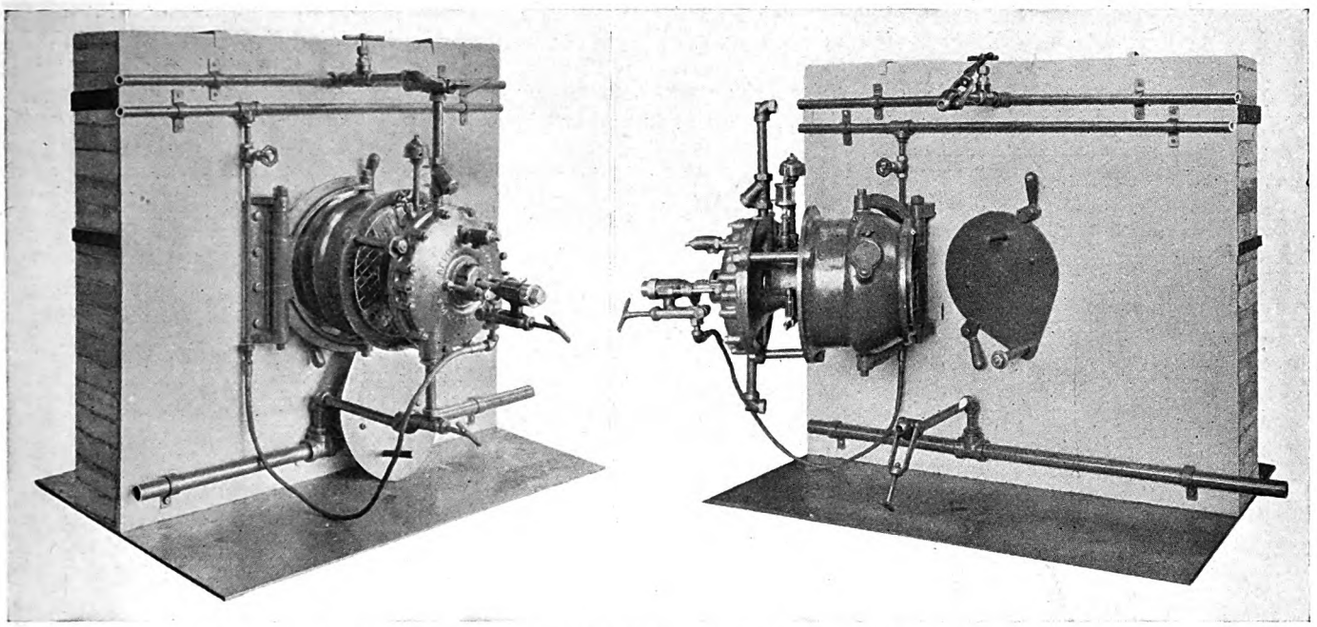


Mayflower Design Oil Burner Which Eliminates All Ducts for Forced Draft Service

the condenser, which is an important feature for merchant vessels. A continuous indication of the quality of the condensate is shown at all times, the warning lights showing as in the case of the evaporator, but with a slightly different range. The white light shows a density up to 0.3 grain, the green light shows from 0.3 up to 1 grain, and the red light shows above 1 grain.

MAYFLOWER DESIGN BURNER

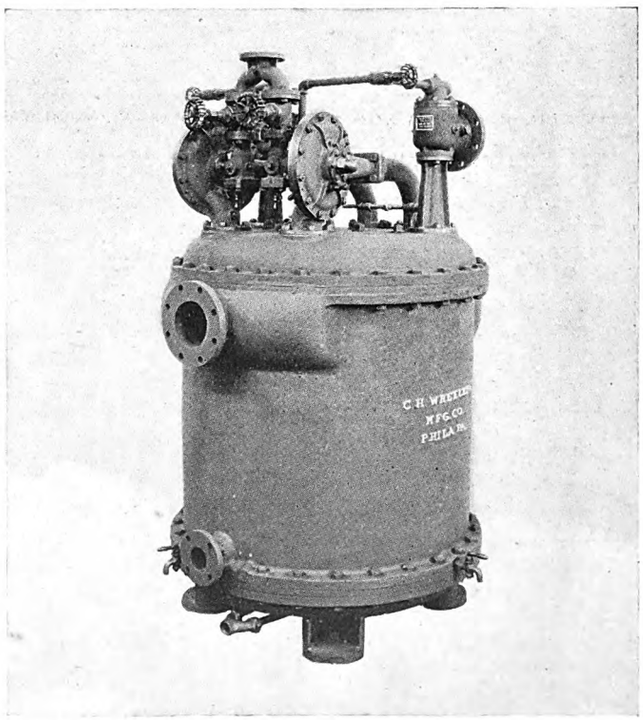
The Mayflower design burner consists of the main casting with a bladed cone, to which a hollow shaft turbo blower is attached. The atomizer fits through the blower shaft and may be moved in and out by the adjustment of coupling studs. A quick detachable yoke and coupling, similar to that used on other Babcock & Wilcox types of burners is also fitted to the atomizer. An impeller blade is fastened to the bladed cone by means of lugs. Access may be gained to the furnace by swinging aside the burner which is hinged. This also provides for the insertion of a fire tile plug which is put in place when the burner is not in use. Steam connections to the turbine are detachable and somewhat similar to the quick detachable yoke and coupling used on the oil burner connection.

The special advantages claimed for the burner are that on forced draft work it eliminates all ducts as well as the large blowers supplying air to the ducts; further, any number of burners can be run independently without having air leakage through dead burners, as is sometimes found when double front construction is used. As the air for combustion can be regulated very closely to the required amount, owing to the multiplicity of speeds available with the turbo blower, higher efficiency can be obtained.

Radojet Air Pump for Closed Feed Water Systems

THE latest development of the C. H. Wheeler Manufacturing Company of Philadelphia is a new type Radojet marine air pump designed for closed feed water systems.

Two small surface condensers combined in one unit are arranged, one between the first and second stage, and one after the second stage. The first one is called the intercondenser and the second the after-condenser. The first condenses the steam discharged from the first stage, while the second one condenses that from the second stage. The condensate from the main condenser is used as circulating water for both condensers. With this arrangement the condensate does not come in contact with the air discharged by



Radojet Air Pump for Marine Service

the Radojet. All the heat contained in the steam is returned to the boilers which results in a thermal efficiency of about 98 percent.

In each of the two condensers provision is made for a cold water pass, which is supplied from the main circulating pump. This water supply is used only when starting up the main turbine unit, when there is not sufficient condensate

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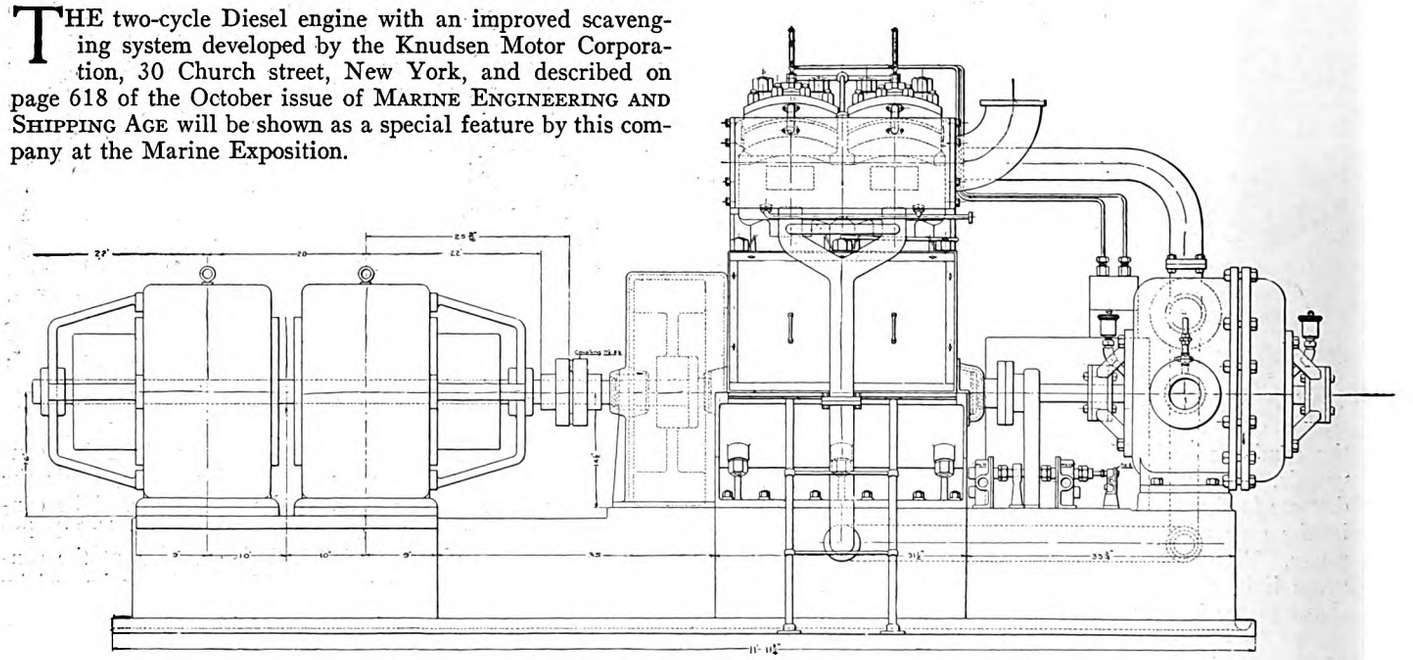
available for condensing the steam of the Radojet. This water supply is automatically regulated by a thermostat, which shuts the supply off as soon as sufficient condensate from the main condenser is furnished for condensing the steam of the Radojet.

The Knudsen Improved Scavenging Diesel Engine

THE two-cycle Diesel engine with an improved scavenging system developed by the Knudsen Motor Corporation, 30 Church street, New York, and described on page 618 of the October issue of MARINE ENGINEERING AND SHIPPING AGE will be shown as a special feature by this company at the Marine Exposition.



Two Cycle Knudsen Marine Diesel Engine

It is claimed that the high fuel economy and mechanical efficiency of this engine are obtained by the elimination of all but four mechanical motions. Thorough scavenging is secured by introducing two-thirds of the volume of scavenging air into the cylinders through ports circumferentially arranged upon the cylinder walls. One-third of the air is passed through the piston heads to act as a cooling agent for the pistons. This air absorbs a certain quantity of heat in moving through the pistons which increases its volume as well as its velocity, after which it finally passes into the cylinder through the circumferential ports to assist the larger amount of air blowing through the scavenging ports and to complete the expulsion of burnt gases.

The engine can be geared down to the most economical propeller speed by means of a quill type floating pinion and gear. The pinions are made of the finest chrome nickel steel, a material which has proved to be excellent for marine service. The pinion acts in such a way that the teeth of the gear are covered by the necessary film of oil when working which prevents direct metallic contact between the teeth of the pinion and gear, thus insuring long life.

Rubber Surface Cutless Bearings

BUILDERS and owners of tugs, motor boats, launches and all manner of screw-propelled craft have become interested in the unusual performance of the cutless bearing. This bearing will be shown by the B. F. Goodrich Company, Akron, O., at the Exposition.

With a wide adaptation in stern tube and outboard strut bearings, this material has shown ability to absorb screw vibration and prevent scoring of both the bearings themselves and the rotating members.

The secret of the cutless bearing is in its inner surface of grooved olivite rubber. This type rubber shows by scientific test a lower coefficient of friction on its wetted surface (for water can be used as a lubricant on this bearing) than on an oiled babbitted surface. Therefore, an olivite rubber bearing lubricated by water offers less frictional resistance than the metal bearing lubricated by grease or oil.

Another claim for cutless bearings, and it has been borne out in actual service, is that it prevents scoring of the bearing or rotating member when water containing grit, sand or other cutting materials is used. The explanation is this—

Special Rubber Bearing for Stern Tubes and Outboard Struts

by the action of the shaft a constant stream of water is circulated through the spiral groove in the rubber surface of the bearing. When a piece of grit or sand gets into the bearing, it cannot find lodgment in the highly resilient rubber but,

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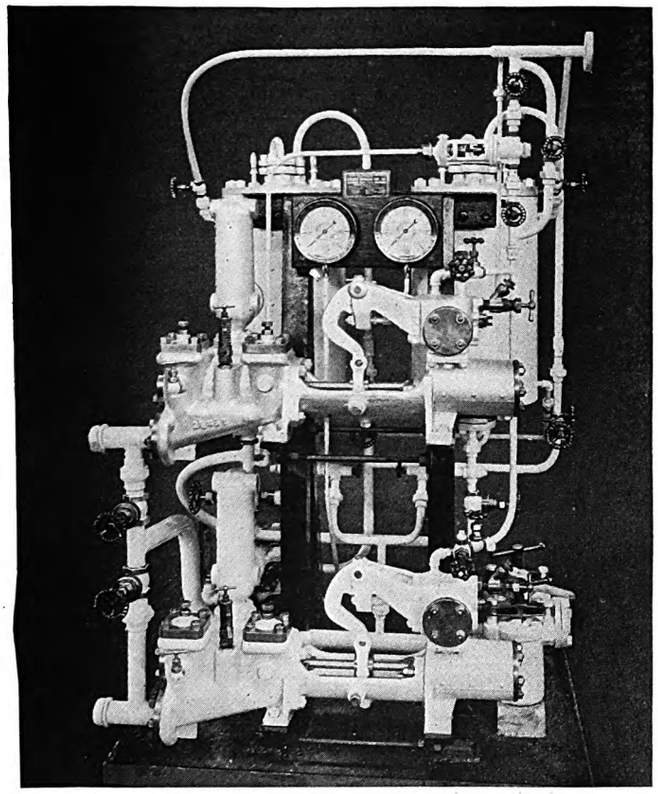
impinging against the bearing wall, is thrust into the groove when the flow of water carries it away. Again, the resiliency of the tough rubber construction of the cutless bearing nullifies in large part vibration of the screw.

Self-Contained Oil Pumping Outfit

THE combined pump and heater set shown in the accompanying illustration is a development to meet the needs for a self-contained unit for fuel oil burning. It forms part of the Bethlehem (Dahl) mechanical oil burning system which is manufactured at the Moore Plant, Elizabeth, N. J., of the Bethlehem Shipbuilding Corporation, Limited.

This self-contained unit consists of the fuel oil pressure



Bethlehem Oil Pumping Unit

pumps, heaters, suction and discharge strainers, with the necessary connecting piping, gages, etc., all mounted on a welded steel base. These units are manufactured in all sizes to meet any requirements in oil burning installations.

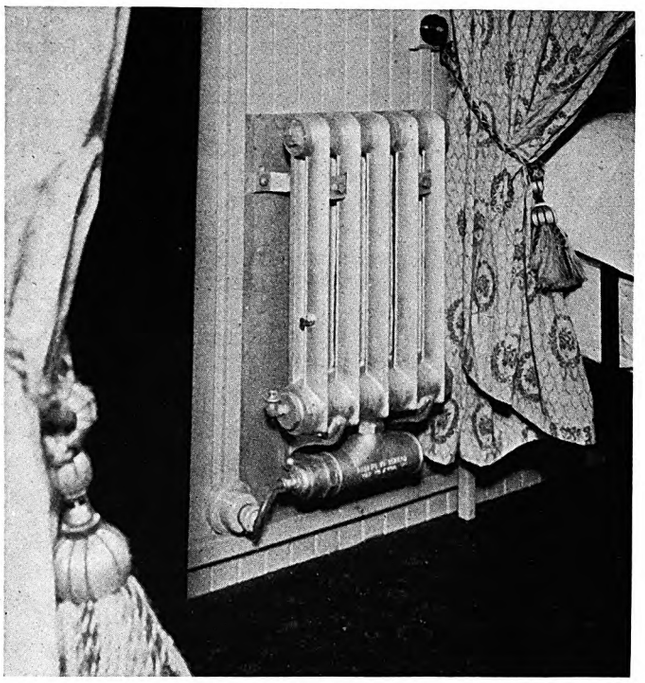
This set is being shown for the first time to the marine industry at the Marine Exposition.

Unusual Electric Radiator

WALTER KIDDE AND COMPANY, New York city, engineers handling the Rich system for detecting and extinguishing fires, will show a novel electric radiator at the Marine Exposition this year. Each electro-vapour radiator is in effect an individual steam heating plant consisting of an ordinary cast iron radiator with a chamber permanently attached containing a small quantity of liquid which vaporized by a contained electric heating element. The liquid will last indefinitely, but the quantity should be inspected each season.

The radiator operates under a vacuum, affording relatively quick heating. The electro-vapour radiator gives, by the turn of a switch, the same ideal heat electrically as the usual steam or hot water radiator.

Electro-vapour radiators are furnished in any size and may be fitted to operate at different heats and voltages. The



Electro Vapor Wall Radiator of the Stateroom Type

heating surface required is calculated in accordance with the usual practice for steam radiation. An approximation is 7 square feet of heating surface for each 20 degree increase in temperature in a room 10 by 12 by 8 feet having one window.

Submarine Direction Finding and Submarine Sounding Apparatus for Small Boats

THE portable submarine direction finder and submarine sounder are devices which the Submarine Signal Corporation, Boston, Mass., has developed after years of experimentation. These devices are designed to afford a much needed protection to those adrift in small boats and will be shown for the first time at the Marine Exposition. The great value of a direction finding device which makes it possible to inform the user of the direction from which sounds are coming and thus enables him to steer his boat or vessel toward the source of sound has been generally recognized. This company has consequently designed portable sending and receiving apparatus wherewith this desired result can be attained.

The submarine direction finder is virtually a large inverted Y. The finder is provided with a collar, surrounding the vertical portion, to which is attached a rod which is used to support it from the side of the vessel. This rod is pinned to the collar, thus forming a hinge which allows the device to move freely backward and forward. A plate is also provided which is designed to be bolted permanently to the rail of the vessel from which the submarine direction finder is to be used. This arrangement is equivalent to gimbals and thus, while permitting the direction finder to be rotated on its vertical axis, at the same time allows the force of gravity to hold the tube always in a vertical position.

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When the submarine direction finder is to be used the rod is inserted in the hole in the plate and a pin inserted to keep the rod and finder in position. This arrangement permits the submarine direction finder to be readily mounted when observations are to be made and removed when the observations have been concluded.

The finder has two rubber bulbs, one on the end of each arm. Two small tubes, one from each bulb, run from the bulbs to the end of the vertical pipe and project as shown in Fig. 1. These bulbs are the underwater ears. Two flexible rubber tubes, known as stethoscope binaurals connect the ends of the small tubes of the direction finder with the ears of the listener. In this way the observer can hear the submarine sounds; he will hear the sound waves striking the left hand bulb in his left ear and those striking the right hand bulb in his right ear.

When an observer is listening to sound in air he can turn his head until he knows apparently instinctively that he is facing the source of sound. This same principle is utilized in the submarine direction finder.

The submarine direction finder is provided with a handle at the top of the vertical piece and, as the vertical piece turns freely in its support, the bulbs can be rotated with the vertical piece as an axis until the sound seems to reach the observer from a point directly in front of him. When this is the case the handle is pointing directly toward the source of sound.

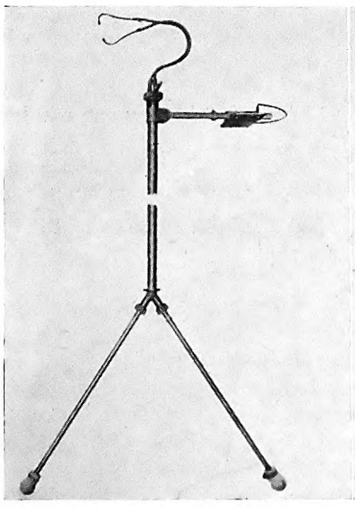


Fig. 1.—Portable Submarine Direction Finder

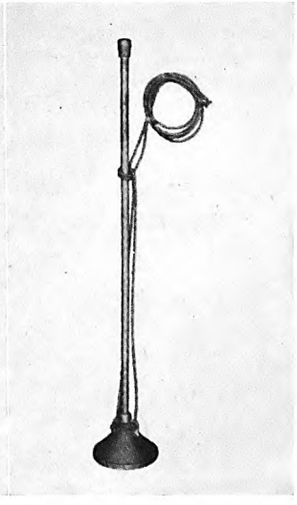


Fig. 2.—Submarine Sounder for Lifeboats

Details of Submarine Sounder

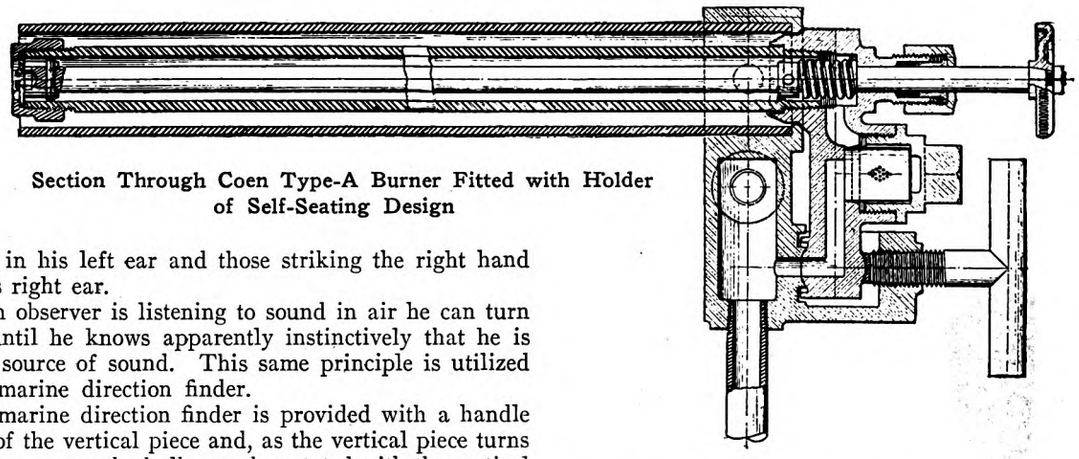
The submarine sounder is shown in Fig. 2. It consists of a metal cup to one side of which is attached a rod. The submarine sounder when in service is hung from the rail of the boat in such a way that the open side of the cup is facing downward and the rod extends upward and somewhat above the rail of the boat. The user is provided with a hammer and the submarine signals are produced by hitting the end of the rod with the hammer.

The signals created in this way are sharp and clear and can be heard at very considerable distances. Moreover they are of a character that enables the submarine direction finder to be used with the greatest ease and accuracy.

Mechanical Oil Burner with Self-Seating Holder

THIS year the Coen Company, oil burning specialists of San Francisco, will show the new type-A mechanical oil burner with self-seating holder as a feature of their exhibit.

The Coen burner is a flexible mechanical oil burner. By flexible is meant a burner that can produce a full fire or a small fire at the will of the fireman and change from one fire to the other instantly without extinguishing the flame, altering the oil pressure, or impairing the quality of the flame.



Section Through Coen Type-A Burner Fitted with Holder of Self-Seating Design

This control is made possible by the adjustable burner tip. The complete burner consists of a special inner valve, a short piece of tubing, a tip, a cap to hold the tip in place and a steel rod running through the burner to provide means for regulating the discharge from the tip. The Coen burner will operate with fuel oil of any gravity.

The regulating rod in the burner has a rotative movement of ¼ inch only. When turned to the extreme left the burner is wide open delivering the maximum fire. By turning the rod to the right the fire is gradually diminished until the stop pin comes in contact with the shoulder of the burner tip at which point the minimum or standby fire is produced. It is not possible to turn the rod far enough to extinguish the fire for the burner valve is for regulating only and not a shut-off valve. The sectional view shown is a burner with the type-A self-seating burner socket.

Great Congress to Feature Marine Week

(*Continued from page 684*)

ship of the American merchant marine, the *Leviathan,* the *Minnewaska* of the Atlantic Transport Lines, the *Seekonk,* one of the latest type American motorships reconditioned by the William Cramp & Sons Ship and Engine Building Company, the *Cleveland* of the United American Lines and the *Westphalia* of the Hamburg-American Line.

Banquets to be Held

The American Marine Congress will hold a banquet under the auspices of the American Marine Association on Thursday evening, November 8 at 7:30 P. M. in the grand ball room of the Waldorf-Astoria hotel. Secretary of Com-

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merce Herbert Hoover; O. E. Bradfute, president of the American Farm Bureau Federation; Winthrop L. Marvin, vice-president of the American Steamship Owners' Association; Admiral Plunkett, United States Navy, and Captain Irving O'Hay, famous adventurer upon whose life was based Richard Harding Davis' "Soldiers of Fortune," will be among the principal speakers of the evening. Secretary of the Navy Denby has directed the 80-piece band of the U. S. Battleship *Colorado* to be in attendance to furnish a concert during the evening.

The annual banquet of the Society of Naval Architects and Marine Engineers will also be held in the grand ball room of the Waldorf-Astoria on Friday evening, November 9.

The New Shipping Board Plan

By Harold F. Lane

WASHINGTON, D. C.

THE Shipping Board has worked out a plan for the operation of the Government-owned ships, as a substitute for the previous managing operator plan, which seems to amount practically to direct Government operation, at least for the present, while avoiding the legal obstacles which Attorney General Daugherty found to stand in the way of the board's plan for operation through subsidiary corporations. Under the plan as announced by the board on October 16 to be put into effect in the immediate future in the North Atlantic, United Kingdom and Ireland service by the consolidation of five routes into one line, the physical operation of the ships will be under the direct supervision of the board, while the soliciting and booking of freight, the handling of the freight at the terminals and its loading on board ship will be in the hands of loading agents, under contract with the board and paid for on a strictly commission basis. In other words, the plan is one of subsidiary organizations but not subsidiary corporations, as the Attorney General held that to turn the ships over to separate corporations would amount to a sale of the vessels not in accordance with the provisions of the law.

Under the existing plan the managing operators operate the ships for the Government and receive a commission on the business done as well as a husbanding fee, while the Government receives the revenues and pays the expenses. It is the announced intention of the board to utilize as far as possible the experience and services of the present operators as loading agents, but according to the board's announcement, "the monies appropriated by Congress will be expended under the direction of the board and under the immediate supervision of Government officials." Complete details of the plan, which is expected to be applied to other services, have not yet been made public, nor has the exact nature of the contract to be entered into with the loading agents been disclosed, although it is stated that the contracts will provide for such modification as experience shows to be desirable and can be terminated at the board's discretion upon reasonable notice. At the White House it was stated that the President had not approved any specific plan but expected to confer further with Chairman Farley before anything was done of a permanent nature.

According to the statement issued by Chairman Farley announcing the plan, the board considered that it "had worked out a solution of the problem of operating its ships so as to utilize as far as practicable the recommendations received from those familiar with the present day shipping problems." He added that "it is expected by this arrangement that the hearty co-operation and best endeavors of experienced private shipping organizations will be obtained and utilized to the fullest extent in conducting the Government's shipping operations."

The board hopes that considerable savings will result from the consolidation of routes, and this action means, Mr. Farley said, that "the American Government intends to remain squarely behind the maintenance of these American flag routes. The changes determined upon are intended to give better, more efficient and more elastic service between this country's North Atlantic ports and those on the east and west coasts of the United Kingdom."

NEW ORGANIZATION FOR U. S. LINES

The board has also announced a reorganization of the management of the United States Lines which, it was stated, "makes of the United States Lines practically a subsidiary corporation of the Emergency Fleet Corporation."

The supervision of the United States Lines has been placed under a sub-committee of the Shipping Board consisting of Commissioner O'Connor, as chairman, and Commissioners Plummer and Benson.

The relations of this sub-committee to the affairs of the United States Lines will be essentially those of a committee of a board of directors to whom the board has delegated immediate supervision. W. J. Love is to be managing director. He has resigned as general manager of the Fleet Corporation. T. H. Rossbottom will be appointed general manager in charge of operations.

"The new arrangement makes of the United States Lines practically a subsidiary corporation of the Emergency Fleet Corporation," Mr. Farley said. "The operating department of the United States Lines will have immediate supervision of the physical operation, maintenance and care of the ships, victualing and purchasing departments, and all other activities pertaining to the operation of the vessels of the line. There will be a freight traffic manager and a passenger traffic manager also. The treasurer of the Fleet Corporation is to be treasurer of the United States Lines. The general comptroller of the Fleet Corporation will have charge of the accounting. This change in the operation of the United States Lines is to be immediately effective."

American Legion Pledges Aid for Upbuilding of Merchant Marine

AT the fifth annual convention of the American Legion held last month in San Francisco the following resolution, proposed by Edward Elwell Spafford, commander of the Department of New York, was adopted:

"If all navies were sunk by treaty, merchant marines would then be the principal source of naval power. On this basis Great Britain would at present have as much power as all of the larger nations combined. While it is unlikely that nations will agree to a complete elimination of navies, we recommend that all practicable steps be taken to build up the American merchant marine to a size commensurate with the size of the Navy and proportionate to the size and wealth of this country.

"As the merchant marine will be called on in time of war to support the Navy, there should be close co-operation in time of peace between the departments of the Navy and the merchant marine. In order to aid our merchant marine, as well as to economize on naval expenses and to train regular Navy personnel on combatant ships, we recommend that auxiliary vessels required for naval purposes in time of peace be chartered from well-established merchant lines.

"We desire to see at least 50 percent of the trade of this country carried in American-built ships flying the American flag and manned by American officers and men all of whom shall live like Americans. To this end we again solemnly pledge our best efforts."

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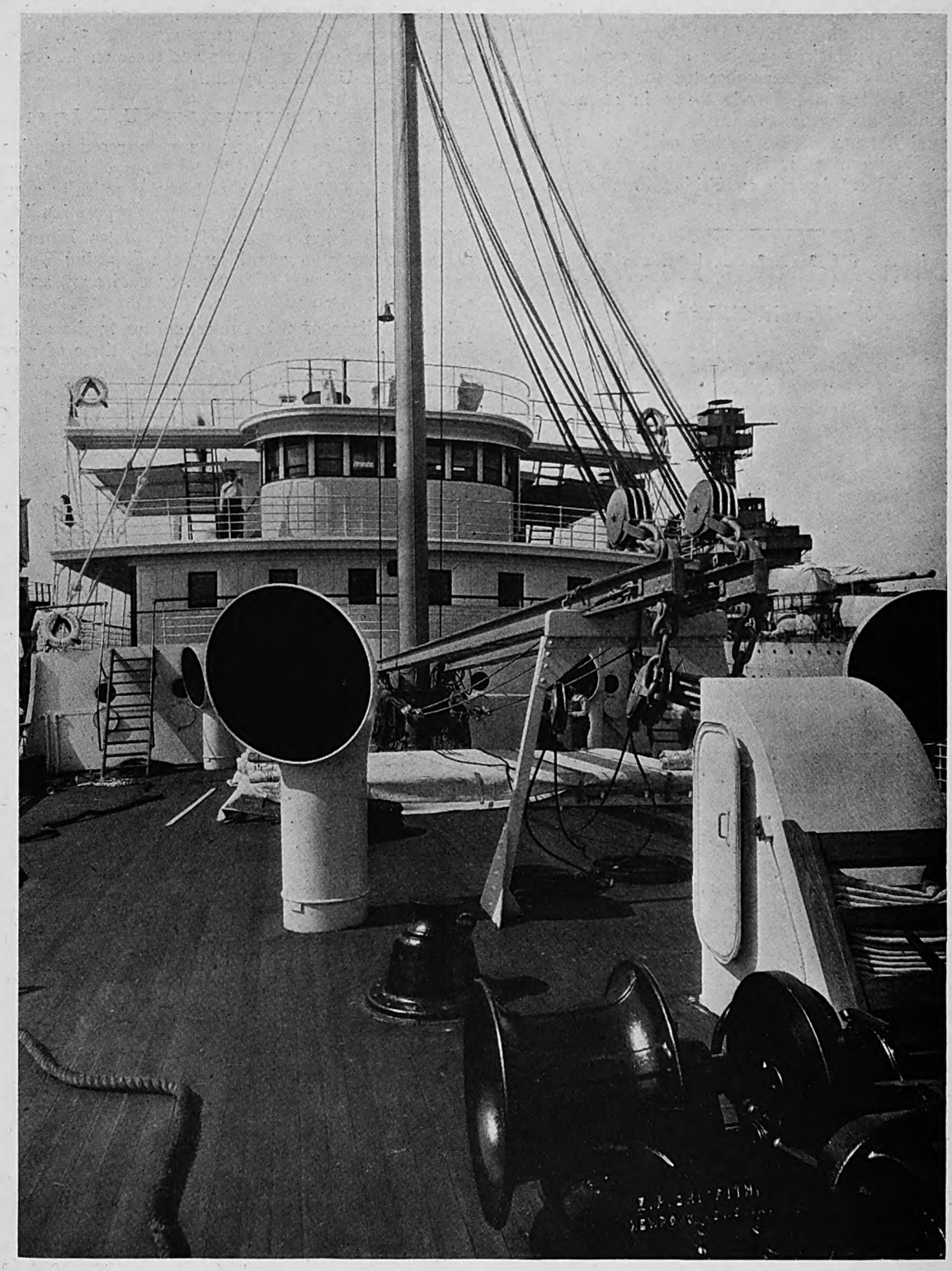

Looking Aft on the Forward Deck of the Savannah Liner City of Chattanooga Showing the Steel Cargo Booms

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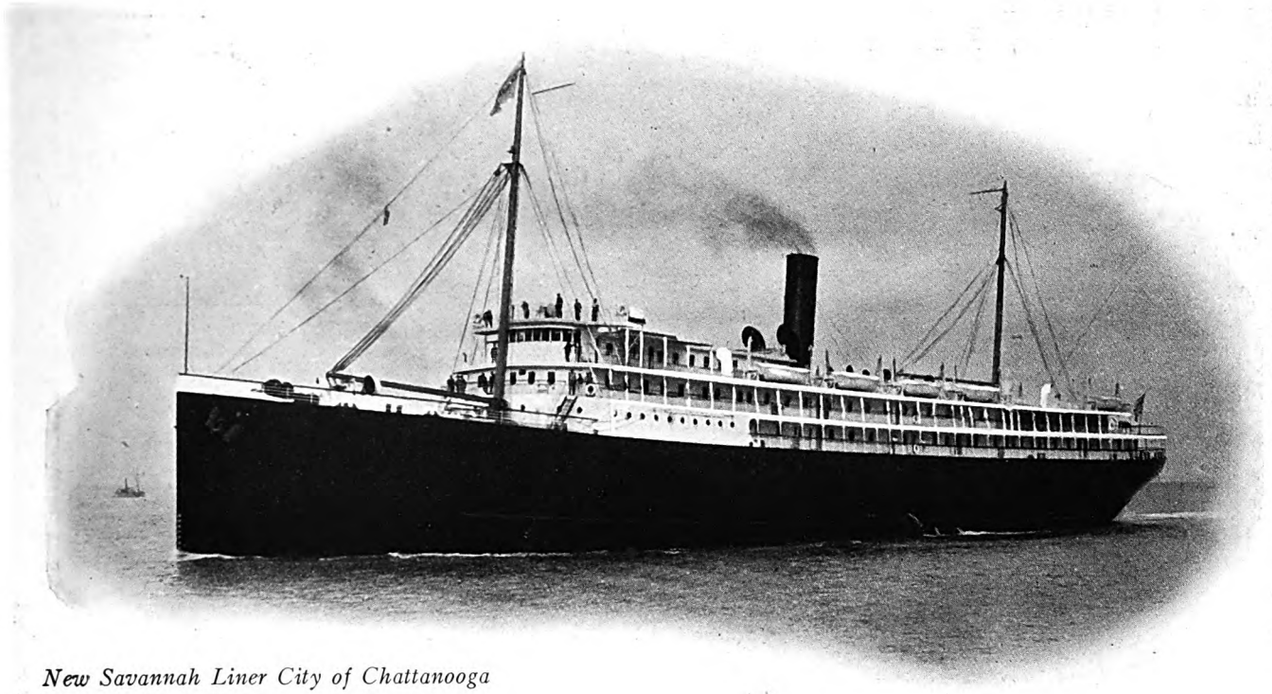


New Savannah Liner City of Chattanooga

New Savannah Liner Added to Atlantic Coastwise Fleet

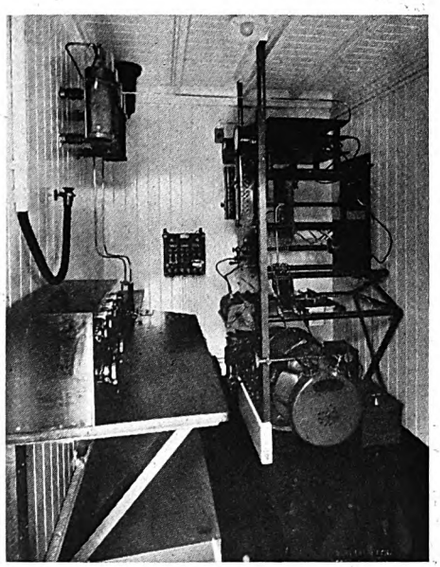
The City of Chattanooga, First of Two Sister Ships Built at Newport News for the Ocean Steamship Company, Goes Into Service

THE accompanying photographs and plans give a good idea of the S. S. *City of Chattanooga,* the latest addition to the Ocean Steamship Company's fleet. This fine vessel was placed in the New York-Savannah service early in October and will be followed this month by her sister ship, the *City of Birmingham.*

Built by the Newport News Shipbuilding and Dry Dock Company, Newport News, Va., to the highest class of the American Bureau of Shipping, the *City of Chattanooga* may be taken as the "last word" in American coastwise vessels. While the general arrangement is similar to that of the *City of St. Louis* and *City of Montgomery* it will be noted that an additional deck, the boat deck, has been fitted as well as other additions, both in structure and equipment.

The general dimensions and particulars of the ship are as follows:

Length overall	401 feet
Length between perpendiculars	382 feet
Beam, molded	52 feet
Depth, molded, to hurricane deck	35 feet
Depth of double bottom	3 feet 6 inches
Load draft	18 feet 6 inches
Load displacement	7,180 tons
Approximate deadweight at 18-foot 6-inch draft	3,500 tons
Cargo capacity	323,596 cubic feet
Bunker capacity	457 tons
Tonnage, gross	5,861
Tonnage, net	4,343



Wireless Room

The hull is constructed of steel with six watertight bulkheads, inner bottom from fore to after peak bulkheads and four plated decks—the orlop, lower, main and hurricane. The shell is plated with in-and-out strakes, the frames being joggled over the landing edges. The decks, in cargo spaces, are supported by girders and wide-spaced stanchions.

The entire hurricane and promenade decks are given over to passenger accommodation, provision being made for 164 first and 40 second class passengers.

There are 72 first class staterooms equipped with berths, the upper berths being of the Pullman type. Each of these rooms is provided with a 12-inch electric fan, hot and cold running water and a steel thermos bottle for drinking water.

In addition to the berth rooms, there are ten suites, each of which is equipped with twin beds, bureau, wardrobe and private bath.

There are also eight private bathrooms, so arranged in conjunction with the ordinary staterooms that they may be placed at the disposal of occupants of connecting rooms, thus

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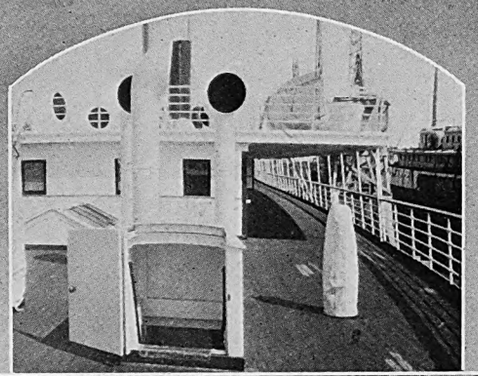
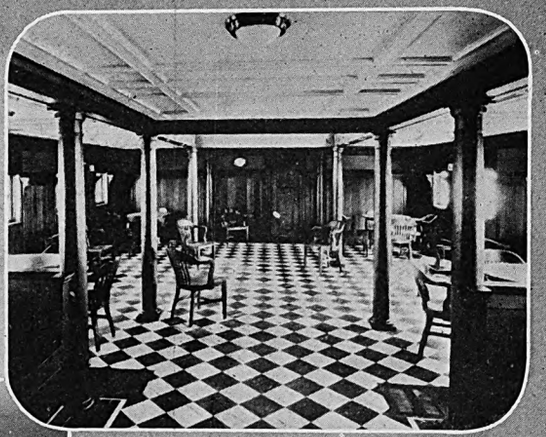
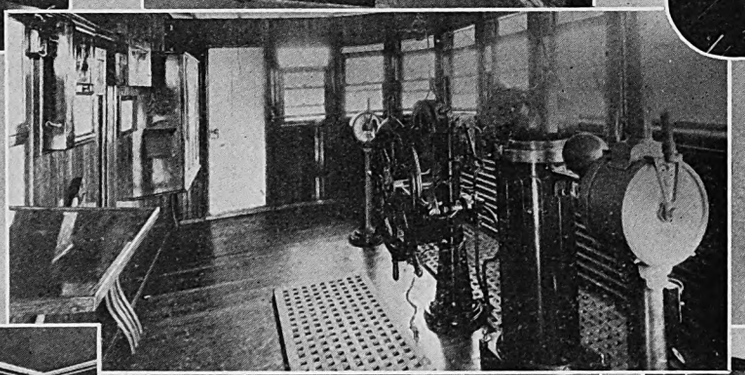




Lobby and Stairway

Main Dining Saloon



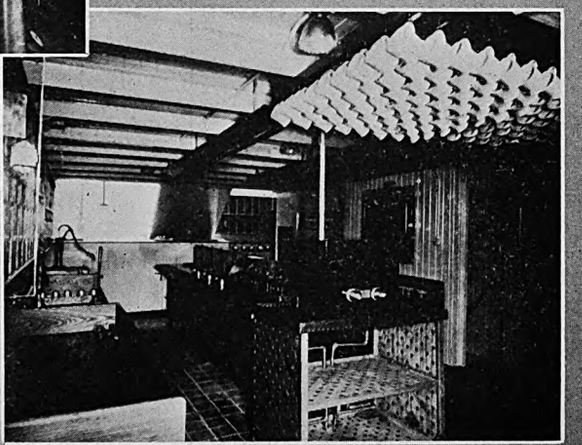
Smoking Room

Pantry

Promenade Deck

Pilot House

Music Room



Interior Views on New Savannah Liner City of Chattanooga

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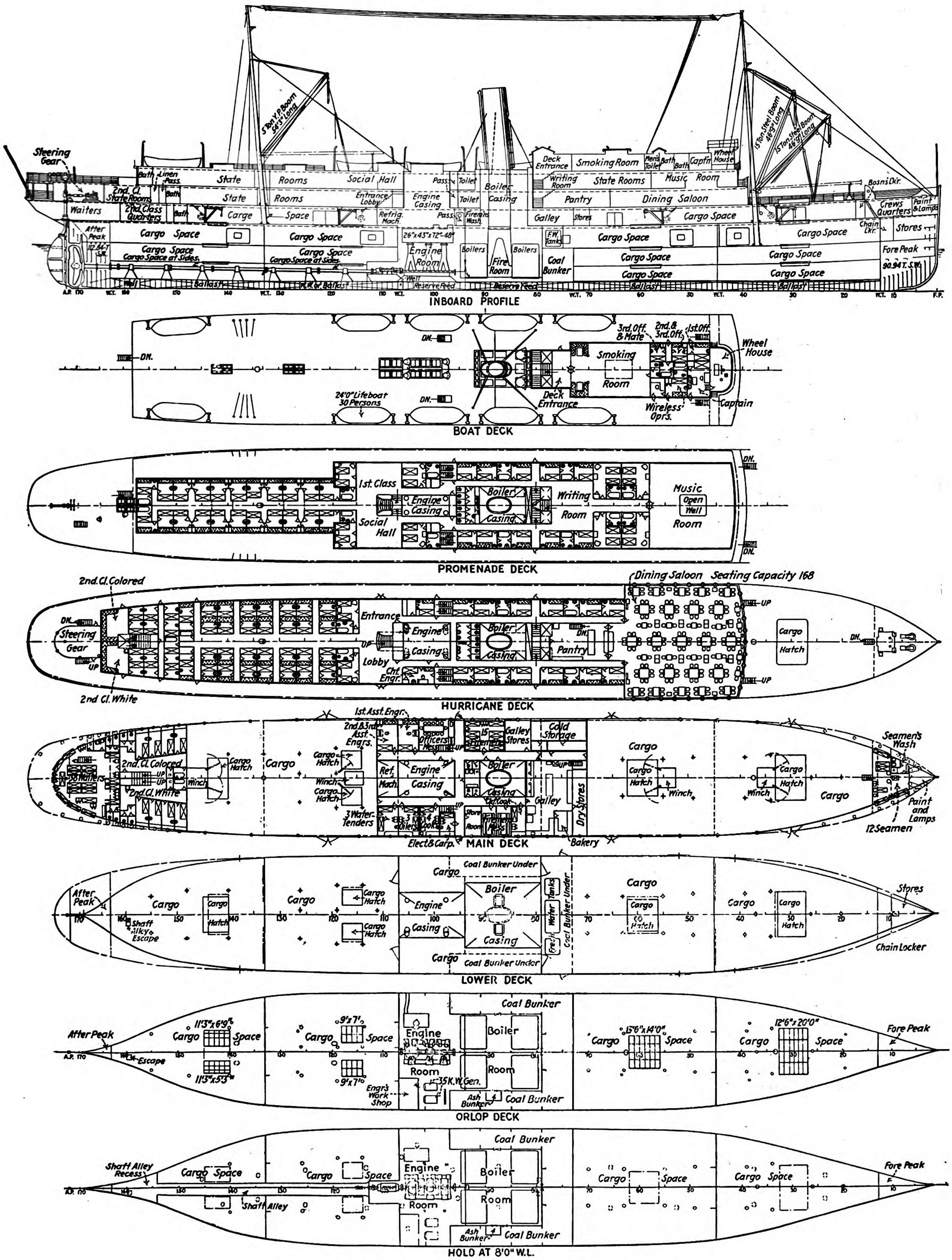

Inboard Profile and Deck Plans of S. S. City of Chattanooga

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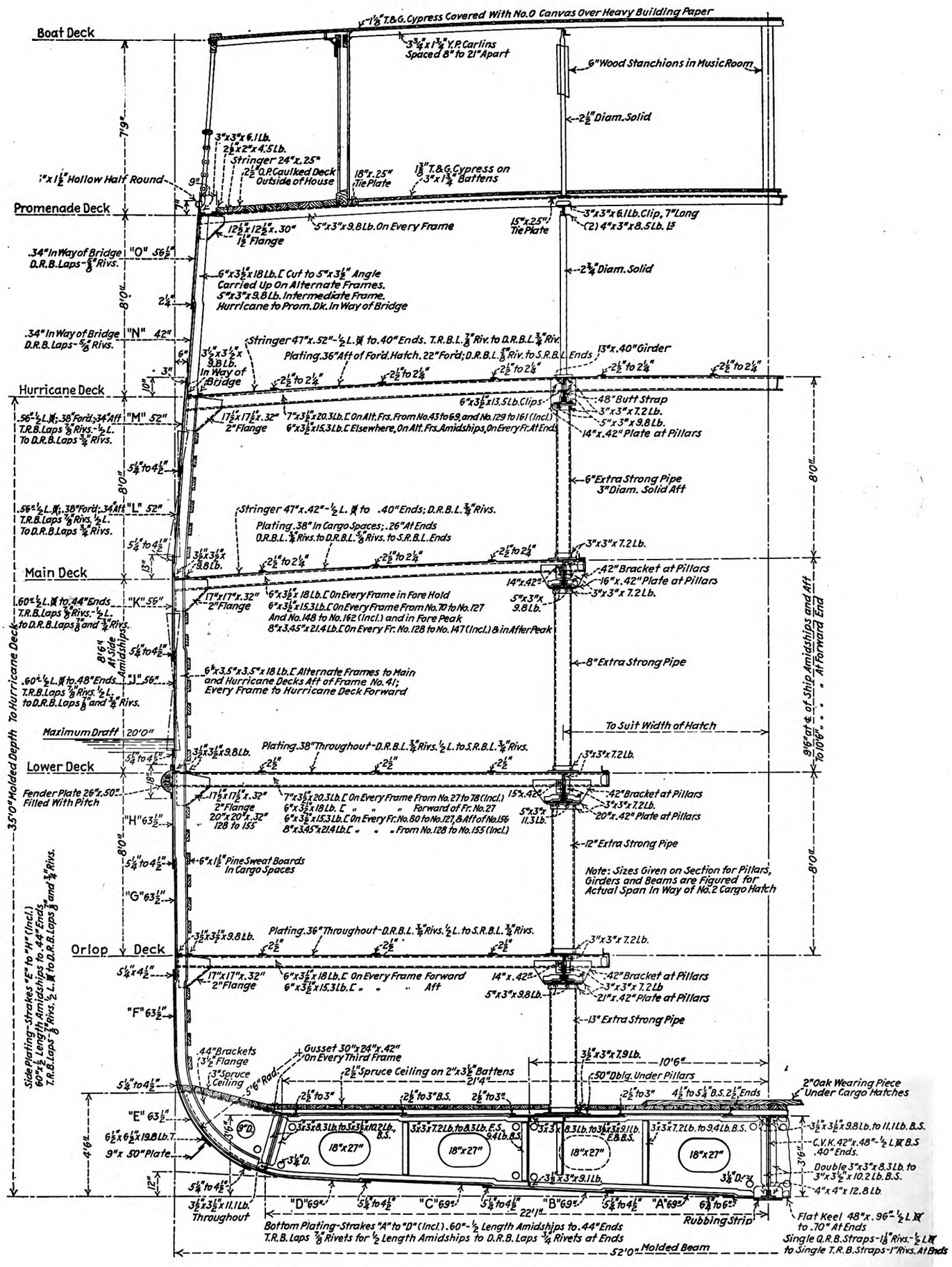
Boat Deck
Promenade Deck
Hurricane Deck
Main Deck
Lower Deck
Orlop Deck
1⅛" T.&G. Cypress Covered With No.0 Canvas Over Heavy Building Paper
3¾"x1¾" Y.P. Carlins Spaced 8" to 21" Apart
6" Wood Stanchions in Music Room
2½" Diam. Solid
3"x3"x6.1 Lb.
2½"x2"x4.5 Lb. Stringer 24"x.25"
2½" O.P. Caulked Deck Outside of House
3"x1½" Hollow Half Round
18"x.25" Tie Plate
1⅜" T.&G. Cypress on 3"x1¾" Battens
3"x3"x6.1 Lb. Clip, 7" Long
(2) 4"x3"x8.5 Lb. Ls
12½"x12½"x.30" 1½" Flange
5"x3"x9.8 Lb. On Every Frame
15"x.25" Tie Plate
.34" In Way of Bridge D.R.B. Laps-⅝" Rivs.
"O" 56½"
6"x3½"x18 Lb. [Cut to 5"x3½" Angle Carried Up On Alternate Frames. 5"x3"x9.8 Lb. Intermediate Frame. Hurricane to Prom. Dk. In Way of Bridge
2¾" Diam. Solid
8'0"
2¼"
.34" In Way of Bridge D.R.B. Laps-⅝" Rivs.
"N" 42"
Stringer 47"x.52"-½ L. to .40" Ends. T.R.B.L. ⅞" Riv. to D.R.B.L. ¾" Riv.
Plating .36" Aft of Ford. Hatch. 22" Ford; D.R.B.L. ⅞" Riv. to S.R.B.L. Ends
13"x.40" Girder
3½"x3½"x9.8 Lb. In Way of Bridge
6"
.3"
10"
2½" to 2¼"
6"x3½"x13.5 Lb. Clips
48" Butt Strap
3"x3"x7.2 Lb.
5"x3"x9.8 Lb.
14"x.42" Plate at Pillars
.56"-½ L. to .38" Ford; .34" Aft "M" 52"
T.R.B. Laps ⅞" Rivs.-½ L. To D.R.B. Laps ¾" Rivs.
17½"x17½"x.32" 2" Flange
7"x3½"x20.3 Lb. [On Alt. Frs. From No. 43 to 69, and No. 129 to 161 (Incl.)
6"x3½"x15.3 Lb. [Elsewhere, On Alt. Frs. Amidships, On Every Fr. At Ends
5¼" to 4½"
8'0"
6" Extra Strong Pipe 3" Diam. Solid Aft
.56"-½ L. to .38" Ford; .34" Aft "L" 52"
T.R.B. Laps ⅞" Rivs.-½ L. To D.R.B. Laps ¾" Rivs.
Stringer 47"x.42"-½ L. to .40" Ends; D.R.B.L. ¾" Rivs.
Plating .38" In Cargo Spaces; .26" At Ends D.R.B.L. ¾" Rivs. to D.R.B.L. ⅝" Rivs. to S.R.B.L. Ends
3"x3"x7.2 Lb.
3½"x3½"x9.8 Lb.
2½" to 2¼"
.42" Bracket at Pillars
16"x.42" Plate at Pillars
14"x.42"
3"x3"x7.2 Lb.
5"x3"x9.8 Lb.
8'8" At Side Amidships
.60"-½ L. to .44" Ends "K" 56"
T.R.B. Laps ⅞" Rivs.-½ L. to D.R.B. Laps ¾" and ⅞" Rivs.
17"x17"x.32" 2" Flange
6"x3½"x18 Lb. [On Every Frame in Fore Hold
6"x3½"x15.3 Lb. [On Every Frame From No. 70 to No. 127 And No. 148 to No. 162 (Incl.) and in Fore Peak
8"x3.45"x21.4 Lb. [On Every Fr. No. 128 to No. 147 (Incl.) & in After Peak
8" Extra Strong Pipe
.60"-½ L. to .48" Ends "J" 56"
T.R.B. Laps ⅞" Rivs.-½ L. to D.R.B. Laps ¾" and ⅞" Rivs.
6½"x3.5"x3.5"x18 Lb. [Alternate Frames to Main and Hurricane Decks Aft of Frame No. 41; Every Frame to Hurricane Deck Forward
35'0" Molded Depth To Hurricane Deck
Maximum Draft 20'0"
To Suit Width of Hatch
96" at ℄ of Ship Amidships and Aft to 106" at Forward End
3½"x3½"x9.8 Lb.
Plating .38" Throughout-D.R.B.L. ¾" Rivs. ½ L. to S.R.B.L. ¾" Rivs.
3"x3"x7.2 Lb.
Fender Plate 26"x.50" Filled With Pitch
17"x17"x.32" 2" Flange
20"x20"x.32" 128 to 155
7"x3½"x20.3 Lb. [On Every Frame From No. 27 to 78 (Incl.)
6"x3½"x18 Lb. [" " " Forward of Fr. No. 27
6"x3½"x15.3 Lb. [On Every Fr. No. 80 to No. 127, & Aft of No. 156
8"x3.45"x21.4 Lb. [" " From No. 128 to No. 155 (Incl.)
15"x.42"
5"x3"x11.3 Lb.
.42" Bracket at Pillars
3"x3"x7.2 Lb.
20"x.42" Plate at Pillars
"H" 63½"
12" Extra Strong Pipe
5¼" to 4½"
6"x1½" Pine Sweat Boards In Cargo Spaces
Note: Sizes Given on Section for Pillars, Girders and Beams are Figured for Actual Span In Way of No. 2 Cargo Hatch
"G" 63½"
Plating .36" Throughout-D.R.B.L. ¾" Rivs. ½ L. to S.R.B.L. ¾" Rivs.
3"x3"x7.2 Lb.
17"x17"x.32" 2" Flange
6"x3½"x18 Lb. [On Every Frame Forward
6"x3½"x15.3 Lb. [" " Aft
14"x.42"
5"x3"x9.8 Lb.
.42" Bracket at Pillars
3"x3"x7.2 Lb
21"x.42" Plate at Pillars
"F" 63½"
13" Extra Strong Pipe
Side Plating-Strakes "E" to "H" (Incl.) 60"-½ Length Amidships to .44" Ends T.R.B. Laps ⅞" Rivs. ½ L. to D.R.B. Laps ¾" and ⅞" Rivs.
.44" Brackets 3½" Flange
Gusset 30"x24"x.42" On Every Third Frame
3½"x3"x7.9 Lb.
10'6"
3" Spruce Ceiling
2½" Spruce Ceiling on 2"x3½" Battens
21'4"
.50" Dblg. Under Pillars
2" Oak Wearing Piece Under Cargo Hatches
5⅝" Rad.
2½" to 3"
2½" to 3" B.S.
4½" to 5¼" B.S. 2½" Ends
"E" 63½"
6½"x6½"x19.8 Lb. T.
9"x.50" Plate
4'6"
(9" D.
3"x3"x8.3 Lb. to 3½"x3½"x10.2 Lb. B.S.
3"x3"x7.2 Lb. to 8.3 Lb. E.S. 9.4 Lb. B.S.
3½"x3"x8.3 Lb. to 3½"x3½"x9.1 Lb. E.B.S.
3½"x3"x7.2 Lb. to 9.4 Lb. B.S.
18"x27"
3¼" D.
3½"x3"x9.1 Lb.
3½"x3½"x9.8 Lb. to 11.1 Lb. B.S.
C.V.K. 42"x.48"-½ L. to B.S. .40" Ends.
3'6"
Double 3"x3"x8.3 Lb. to 3"x3½"x10.2 Lb. B.S.
4"x4"x12.8 Lb.
12"
5¼" to 4½"
3½"x3½"x11.1 Lb. Throughout
"D" 69"
"C" 69"
"B" 69"
"A" 69"
6¾" to 6"
22'1"
Rubbing Strip
Flat Keel 48"x.96"-½ L. to .70" At Ends
Single Q.R.B. Straps-1⅛" Rivs.-½ L. to Single T.R.B. Straps-1" Rivs. At Ends
Bottom Plating-Strakes "A" to "D" (Incl.) .60"-½ Length Amidships to .44" Ends T.R.B. Laps ⅞" Rivets for ½ Length Amidships to D.R.B. Laps ¾" Rivets at Ends
52'0" Molded Beam

Midship Section of S. S. City of Chattanooga

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Summary of Cargo Space

Between Frames	Space	Net Cubic Feet	Total Cubic Feet
13-45	Ceiling to orlop deck	15,073	
45-73	Ceiling to orlop deck	19,188	
107-133	Ceiling to orlop deck	14,302	
133-154	Ceiling to orlop deck	6.538	
	Total		55,101
13-45	Orlop deck to lower deck	18,428	
45-73	Orlop deck to lower deck	22,982	
107-133	Orlop deck to lower deck	21,132	
133-163	Orlop deck to lower deck	16,520	
	Total		79,062
13-45	Lower to main deck	25,928	
45-79	Lower to main deck	31,935	
79-107	Lower to main deck	13,006	
107-133	Lower to main deck	24,825	
133-163	Lower to main deck	24,633	
	Total		120,327
14-70	Main to hurr. deck	40,787	
111-148	Main to hurr. deck	28,319	
	Total		69,106
	Total cargo space		323,596

NOTE—Capacities of compartments are figured from top of ceiling on tank top and top of plating on decks to bottom of beams at top, to cargo battens at sides and to bulkheads at ends.

Summary of Tanks

Between Frames	Tank	Gallons	Tons Salt Water	Tons Fresh Water
F.P.-13	Fore peak	23,809	90.94	.....
13-45	Inner bottom, No. 1 P	17,378	66.38	.....
13-45	Inner bottom, No. 1 S	17,378	66.38	.....
45-73	Inner bottom, No. 2 P	28,275	108.00	.....
45-73	Inner bottom, No. 2 S	28,275	108.00	.....
73-94	Inner bottom, No. 3 P	23,449	.....	87.08
73-94	Inner bottom, No. 3 S	23,449	.....	87.08
94-106	Inner bottom, No. 4 P	13,236	.....	49.15
94-106	Inner bottom, No. 4 S	13,236	.....	49.15
107-133	Inner bottom, No. 5 P	22,894	87.45	89.94
107-133	Inner bottom, No. 5 S	22,894	87.45	89.94
133-154	Inner bottom, No. 6 P	7,213	27.55	.....
133-154	Inner bottom, No. 6 S	7,213	27.55	.....
163-A.P.	After peak	29,542	112.84	.....
	Total	278,241	782.54	272.46
76-79	Fresh water tank on C. L.	5,092	.....	18.91
76-79	Fresh water tank on port	2,504	.....	9.29
76-79	Fresh water tank on stb'd	2,504	.....	9.29
92-94	Service tanks	400	1.53	1.48
	Grand total	288,737	784.07	311.43

NOTE—7.48 gallons = 1 cubic foot, 35 cubic feet salt water = 1 ton, 36 cubic feet fresh water = 1 ton.

Coal Bunker

Between Frames	Space	Net Cubic Feet	Tons
73-97	Port., stb'd and C. L.	19,219	457.62

Ash bunker, 201 cubic feet, 4.79 tons.

NOTE—Capacity of coal bunker is figured to shell, internals deducted. 42 cubic feet = 1 ton coal.

Equipment

Two 7,665-pound stockless bower anchors.
One, 2,765-pound stockless stream anchor.
270 fathoms 2½-inch stud link chain cable.
90 fathoms 4½-inch circumference steel wire stream line.
120 fathoms 5-inch circumference steel wire tow line.
Two 90-fathom, 8-inch circumference manila hawsers.
Two 90-fathom, 7-inch circumference manila warps.

Scantlings

FRAMES: Spaced 24 inches in peaks, 27 inches elsewhere.

Frames outside double bottom, 6-inch by 3.5-inch by 3.5-inch by 18-pound channels, from peak to peak, extending to main and hurricane decks alternately aft of frame No. 41; with every frame carried up to hurricane deck forward.

Frames in peaks, 6-inch by 3½-inch by 11.7-pound angles with reverse bars.

Frames inside double bottom, 3½-inch by 3-inch by 9.1-pound angles throughout on solid plate floors; 6-inch by 3.5-inch by 3.5-inch by 15.3-pound channels on open floors.

REVERSE FRAMES: On frames in peaks, 3½-inch by 3-inch by 7.9-pound angles in fore peak to hurricane deck on every frame, in after peak to main deck on every frame.

Inside double bottom, on solid plate floors, 3-inch by 3-inch by 8.3-pound angles in holds to 3½-inch by 3-inch by 9.1-pound angles in machinery space. Double under main engine and boiler bearers. Six-inch by 3.5-inch by 3.5-inch by 15.3-pound channels throughout on open floors.

FLOORS: Inside double bottom solid plate floors forward of three-fifths length amidships, in engine and boiler rooms and under outer ends of watertight bulkhead stiffener brackets. Solid floors on every third frame elsewhere with intermediate open floors.

Solid floor plates and brackets on open floors .35-inch in holds, .40-inch in engine space, .46-inch in boiler space.

Floors in peaks, .35-inch; watertight, .38-inch; tank end floors .38-inch.

LONGITUDINALS INSIDE DOUBLE BOTTOM: .34-inch in holds; .40-inch in engine space; .46-inch in boiler space.

DOUBLE BOTTOM PLATING: Center strake and margin .48-inch for ½ length amidships; .625-inch in machinery space; .40-inch at ends. Margin, 31 inches minimum width, exclusive of flange; center strake, 47 inches wide; other strakes, .40-inch ½ length and ends; .625-inch engine space; .625-inch boiler space.

Riveting: Center strake and margin, treble riveted butt laps, ¾-inch rivets for ½ length amidships; treble riveted butt laps, ⅞-inch rivets M. S.; double riveted butt laps, ¾-inch rivets at ends. Other strakes, double riveted butt laps, ⅞-inch rivets in machinery space to double riveted butt laps, ¾-inch rivets.

STEM: 8¾ inches by 2½ inches.

STERN FRAME: Rudder post, 8 inches by 7½ inches.

PROPELLER POST: 9⅜ inches by 7½ inches below boss, 8 inches by 7½ inches above.

RUDDER STOCK: 10 inches diameter.

forming suites for the accommodation of two, four or six people.

Public baths are located on both hurricane and promenade decks, in addition to the private baths before mentioned, and all baths, private and public, are supplied with hot and cold salt and fresh water, and have a shower over each tub.

The public rooms are unusually commodious and are tastefully finished and decorated.

The dining saloon extends the full width of the ship, seats being provided for all passengers at one sitting. The pantry and galley are particularly well arranged for giving prompt service without encroaching upon the entrance passageways, and the grouping of mess rooms, galley stores and refrigerators is such as to give efficient service with the minimum personnel.

The music room is located directly over the dining saloon with a center well opening into the latter. It is supplied with a piano and phonograph and has abundant seating capacity tastefully arranged.

The smoking room is located on the boat deck, an innovation in the Ocean Steamship Company's vessels, made to meet the wishes of those who use the room as well as those who do not.

The joiner trim throughout the first class quarters is of natural mahogany combined with white and gold. The main stairways are paneled in mahogany and have ornamental iron balustrades. The smoking room is finished in fumed oak paneling and has an ornamental glass dome.

With the exception of the music room, which is carpeted, all floors of staterooms, passages and public rooms are covered with "Everlastic," cork or rubber tile.

An automatic fire alarm system is fitted in all staterooms, public rooms and cargo holds.

The provisions for handling and stowing cargo reflect the advance in this department of ship construction. Among these may be noted the increase in height of cargo ports, to ensure the safe and expeditious handling of automobiles.

PROPELLING MACHINERY

The propelling machinery consists of a triple expansion, surface condensing engine having cylinders 23 inches, 43 inches and 72 inches in diameter and 48 inches stroke, designed to develop 2,900 indicated horsepower at 75 revolutions per minute and 200 pounds per square inch working pressure. With this power the ship is capable of a speed of over 12½ knots at normal load draft. The valve gear is of the Stevenson link type with direct acting steam reversing gear. An Edwards air pump, 26 inches in diameter by 21 inches stroke and two bilge pumps, 5 inches diameter by 21 inches stroke, are driven off the main engine. All other pumps are independent.

The crank shaft is 14⅜ inches in diameter; thrust, 14⅜ inches; line, 13¼ inches and tail shaft 14⅞ inches with continuous brass liner.

The propeller is of built-up type, 16 feet in diameter, with cast iron hub and four bronze blades.

The main condenser is circular with cast iron body and approximately 4,100 square feet of cooling surface.

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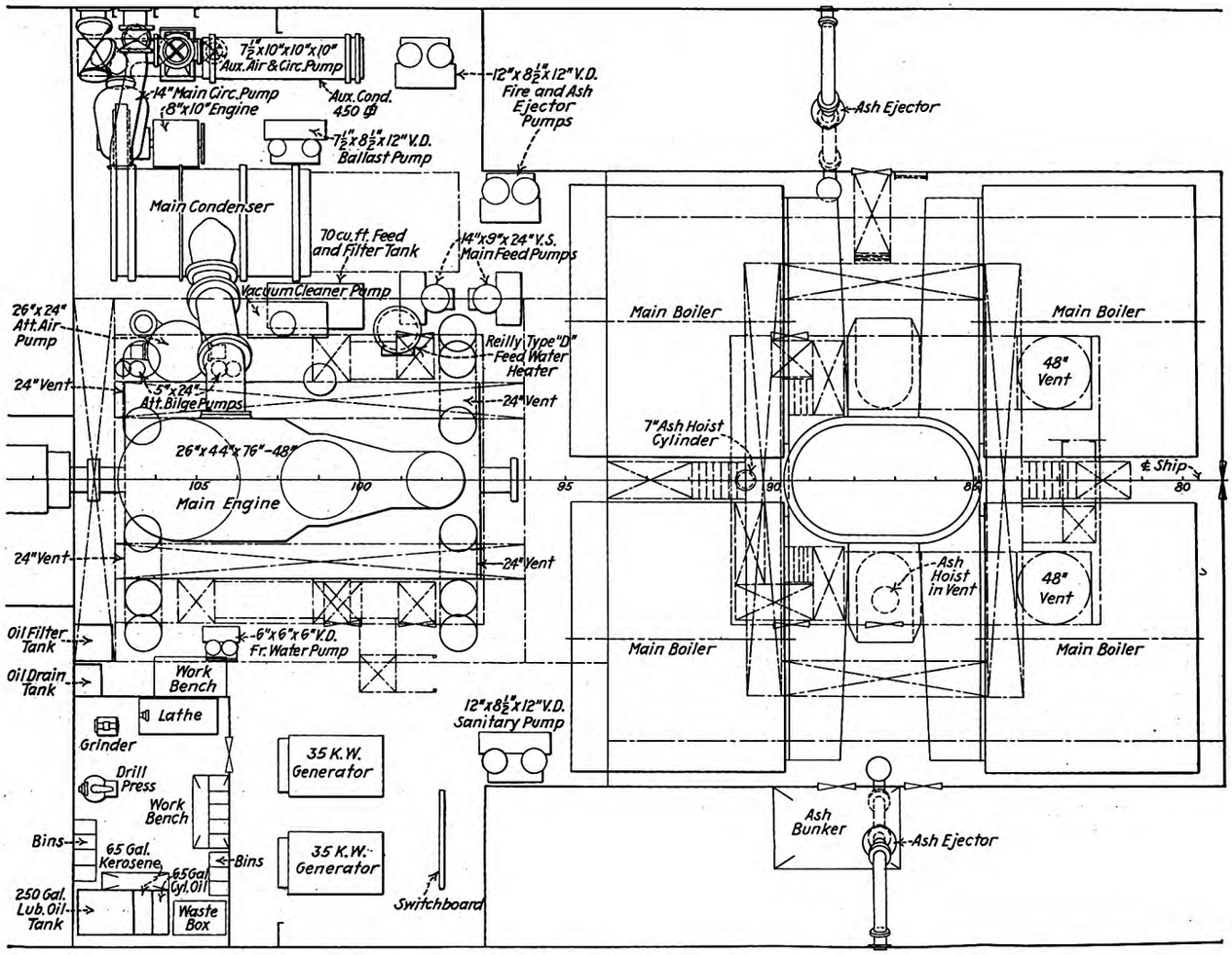

S. S. City of Chattanooga: Plan of Machinery Space

The following auxiliaries are installed:

Centrifugal circulating pump, 14-inch suction and discharge driven by single engine 8 inches diameter by 10 inches stroke.

Auxiliary condenser, 450 square feet cooling surface.

Steam pumps, built by the Warren Steam Pump Company:

2 main and auxiliary feed, single vertical, 14 inches by 9 inches by 24 inches.

2 fire and bilge, duplex vertical, 12 inches by 8½ inches by 12 inches.

1 ballast, duplex vertical, 7½ inches by 8½ inches by 12 inches.

1 sanitary, duplex vertical, 12 inches by 8½ inches by 12 inches.

2 fresh water, duplex vertical, 6 inches by 6 inches by 6 inches.

1 drinking water, duplex horizontal, 3 inches by 2 inches by 3 inches.

1 auxiliary air and circulating combined, 8 inches by 10 inches by 10 inches by 12 inches.

1 ammonia condenser circulating, duplex horizontal, 4½ inches by 3¾ inches by 4 inches.

There is a Reilly multi-coil feed water heater, a combined feed and filter tank of approximately 70 cubic feet capacity and two 2½-inch Metropolitan injectors.

The boilers are four in number, of single end Scotch type, 14 feet 9 inches diameter and 11 feet 6 inches long, over heads; constructed for a working pressure of 200 pounds per square inch. Each boiler has three 46-inch Morison furnaces, connected to separate combustion chambers. The furnaces are fitted to burn coal under natural draft.

The engineers' work shop is provided with a 9-inch engine lathe, drill press and grinder, all motor driven.

The electric plant consists of two 35-kilowatt General Electric generating sets and, in addition, a 10-kilowatt emergency set with gasolene engine by the Matthews Engineering Company. In all there are approximately six hundred 40-watt lamps installed on the vessel, including twelve cargo clusters, and an 18-inch searchlight.

Two Brunswick-Kroeschell 4-ton refrigerating machines are installed for cooling ship's provisions and drinking water.

In general, the *City of Chattanooga* is completely outfitted and equipped as becomes a first class passenger and cargo steamer, and is a notable addition to the coastwise fleet.

Two Important Repair Jobs

THE S. S. *Hoven,* a fine steel tank steamer of approximately 10,000 tons deadweight capacity which was built by the Bethlehem Shipbuilding Corporation, Ltd., at Sparrow's Point, Md., in 1919, struck a submerged rock off San Benito Island on August 29 with the results shown in the illustration.

Such was the force of the blow that practically the entire structure in way of the forepeak, from the 16-foot waterline down, and extending aft for a distance of over 30 feet was destroyed, both the forepeak bulkhead and the forward end of the centerline bulkhead being included in the damaged area. Had the ship been an ordinary cargo steamer, she

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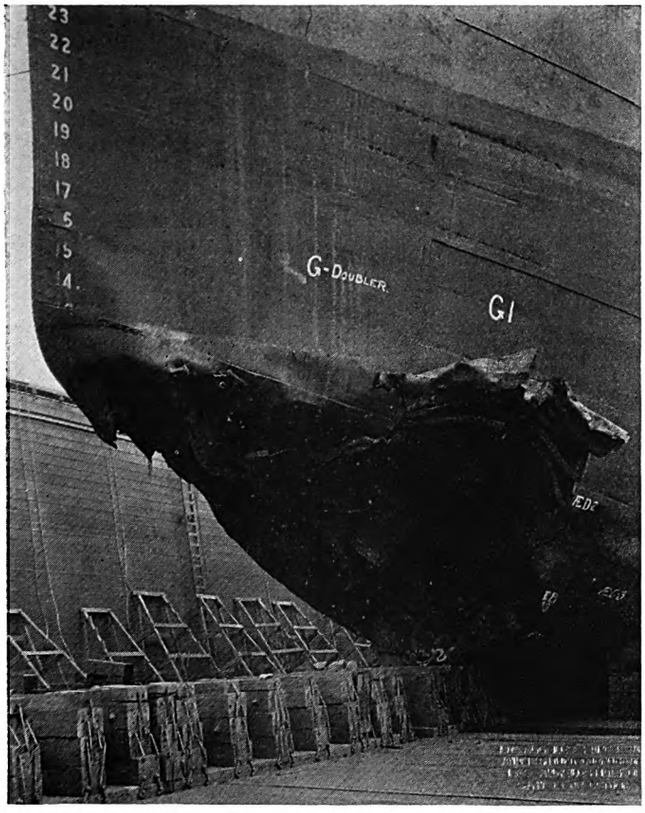
would probably have foundered, but because of the extensive subdivision characteristic of tank steamers, she remained afloat and we understand made port under her own steam.

As indicating the extent of the repairs made necessary by the accident, the following particulars are of interest:

New stem bar from 18-foot waterline to forefoot.
29 shell plates removed and replaced by new.
4 shell plates removed and faired.
11 transverse floor plates with accompanying intercostals, clips, etc., removed and replaced by new.
2 web transverses partially renewed.
18 longitudinals partially renewed and faired.
3 lower strakes of forepeak bulkhead renewed.
2 lower strakes of centerline bulkhead renewed at forward end.
16 breasthooks renewed or faired.

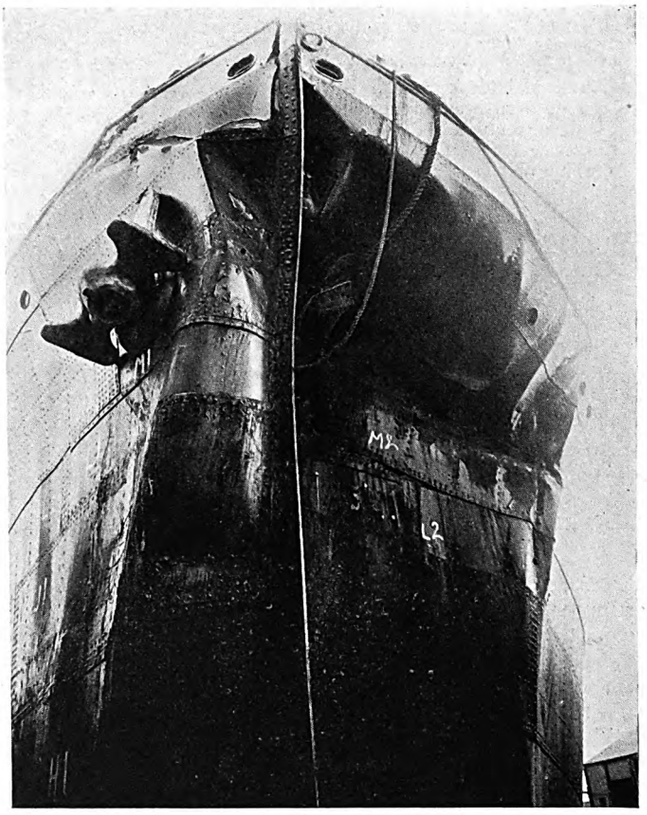
The repairs are being carried out by the Los Angeles Shipbuilding Company at a price of approximately $64,000. It should be noted that this figure covers some bottom damage not shown by the illustration.



Crumpled Bow of Tank Steamer Hooven

Of quite different origin, but of very nearly as serious a character is the damage shown by the two illustrations of the S. S. *West Arrow*. This vessel, a Shipping Board cargo steamer of 8,567 tons deadweight built by Skinner and Eddy, Seattle, Wash., in 1918, was run into by the British S. S. *Haverford* while on a voyage from European ports to Boston. The *Haverford,* a steamer of 11,635 gross tons, was moving at a good rate of speed and apparently struck the *West Arrow* very nearly end on. Thanks to the good material and workmanship of the latter vessel, the structural damage was practically confined to the forepeak, although the ship received a thorough shaking up and the propelling machinery was somewhat disarranged, but not sufficiently to prevent the ship from steaming into Boston, where she was dry docked.

The following is an outline of the repairs made necessary by the collision:



Damage to Bow of S. S. West Arrow Above Waterline

Damage to Bow of S. S. West Arrow Below Waterline

36 shell plates removed and replaced by new.
8 shell plates removed and faired.

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New stem bar and forefoot casting, complete.
10 frames and reverse frames renewed from keel to forecastle deck.
1 hawse pipe casting renewed.
7 forecastle deck beams renewed.
15 main deck beams renewed.
Chain locker renewed.
Forepeak tank top and bulkhead, extensive renewals and fairing.
Turbine and gear casing raised for inspection.
Line shaft couplings to be broken and bearings opened up and adjusted.

The contract for this work has been awarded to the Robins Dry Dock & Repair Company, Brooklyn, N. Y., for $47,970, the time allowed for completing the work being 38 days. In addition to the repairs, this figure covers cleaning the ship's bottom, painting two coats, and ordinary voyage repairs.

British Shipowners Face Keen Competition Abroad

Rapid Growth of New North German Lloyd Fleet — Proposals Advanced for Equalizing Operating Costs—Advantages of the Motorship

By W. H. Wendon

THE question of competition with German and other foreign shipowners is the subject uppermost in the minds of British shipping people at the present time. And in this regard a startling instance has been cited. Sir Fortescue Flannery, a leading consulting marine engineer, estimates that there is a difference of £2,000 in wages on a round-trip in the Europe-South American trade—of course to the advantage of the German shipowner, whose success in this achievement is brought about by cheap coal, cheap stores and light taxation. But, judging from the rapidity with which the German shipping concerns are augmenting their merchant fleets, the competition in the future will be on still more pronounced lines.

The New "N. D. L." Fleet

Take the case of the Norddeutscher Lloyd. According to official data, the "N. D. L.," as it is more generally known, at all events on this side, is making satisfactory progress in the reconstruction of its fleet and the restoration of its overseas connections. Of the 23 ships which were under construction at the beginning of the 1922 business year, seven steamers, of 49,500 tons, were last year completed and taken into service. The building program has been extended by the addition of two cargo steamers, totaling 12,000 tons gross. Further, the passenger and cargo steamer *Bremen,* of 10,826 tons gross, has been acquired. But that is not all. In the course of this year the steamers *Munchen,* of 13,325 tons gross; *Werra,* of 9,475 tons gross; *Ludwigshafen,* of 5,918 tons gross, and *Aachen,* of 6,274 tons gross, have been completed and taken into service, while the 32,000-ton *Columbus,* so far Germany's largest merchant vessel, is the most recent addition. Furthermore, there are still nine steamers, of about 110,000 tons gross, under construction for the "N. D. L.'s" account.

Well may British (and other) shipowners view with considerable concern the coming competition of the German shipping lines, of which, of course, the Norddeutscher Lloyd is but an example. By the middle of the present year, such progress had been made with the restoration of the N. D. L.'s services that the system comprises a weekly service of passenger and cargo steamers to New York, a service of passenger and cargo steamers every three weeks to Brazil, a monthly service to the Far East, and a service every three months to Australia. Most significant of all is the official prediction that for the current business year a satisfactory business result may be anticipated.

British Shipbuilding Needs Support

Apprehension of this increasing competition of German shipping is apparent in various quarters, but only very occasionally are views put forward showing the feeling that lies beneath the surface. It is not unnatural, therefore, that the opinion expressed by Lord Aberconway, head of the famous shipbuilding and engineering firm of John Brown and Company, of Glasgow, should have received at the hands of United Kingdom shipping people in particular, and business men generally, a large measure of attention. Lord Aberconway's views on the shipping, shipbuilding and engineering position are interesting, though depressing. He considers that, regarded from a commercial, as well as from a political, point of view, there never was a time when the shipbuilding and engineering trades in the United Kingdom were in greater need of support. He does not remember, in forty years' experience, any period in which there was such a depression. The great shipowning companies, he points out, have more tonnage than they know what to do with. Many of the vessels, especially in the North Atlantic trade, are crossing at a loss except in the busy passenger season, so that the shipowning trade is not in a position to build more ships. The balance sheets show millions of pounds' worth of bills outstanding, and, so far from placing new orders, a great number of firms are paying large sums to get out of contracts. In regard to engineering works, very much the same sort of thing applies.

What German Competition Means

So much for a bird's-eye view of the shipping and industrial position. But it is when he comes to the cause or causes of this depressing situation that Lord Aberconway lets himself go. Asking: "Will trade come to this country, or will Germany get it?" Lord Aberconway quotes a recent contract for a ship, when the tender from a British firm was 40 percent higher than the quotation of a German firm. This means, he says, that Germany can build tonnage at half the cost we can in this country, and he thinks that this reflects the international position. Apropos the marked disparity between British and German costs, Lord Aberconway lays it down that—

> "Germany has perpetrated the most enormous swindle the world has ever seen in the depreciation of the mark. She has been seeking for gold in every market—European, Asiatic, American—and there are from 450 to 500 million sovereigns banked in Brussels, New York and elsewhere to the credit of German swindlers. They are the great industrial leaders in Germany. They have spent money in putting their undertakings in order, and in putting in the most expensive machinery and every appliance that modern science can devise out of the money of which the whole world has been robbed. Every form of indebtedness has disappeared, including her debentures and her mortgages, and they have no charges to meet. We must face the problem now presented."

It needs no words of mine to make it clear that Lord Aberconway, at all events, has some very definite views as to the gravity of German competition.

Greek Shipowners Pay Crews Lower Wages

One turns, perhaps with a feeling of relief, to shipping competition from another quarter—Greece. Here the ad-

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vantage enjoyed by Greek shipowners as compared with British shipowners turns on the question of wages. Two examples will suffice to reveal that in this matter Greece is a competitor of some caliber. Tabulated, the figures are as follows:

(1) Greek steamer, 4,800 tons deadweight. Crew 22. Daily wages bill £6 13s. 4d.	(1) British steamer. 4,200 tons deadweight. Crew 25. Daily wages bill £9 1s. 6d.
Vessel's daily cost, including provisions and stores, but excluding insurance, £12.	Vessel's daily cost, including provisions and stores, but excluding insurance, £14 13s.
(2) Greek steamer. 8,000 tons deadweight. Crew 32. Daily wages bill £11.	(2) British steamer. 6,600 tons deadweight. Crew 32 Daily wages bill £12 9s.

It is in the matter of wages of the crew, as distinct from those of the officers and engineers, that Greek shipowners are able to effect economies. The captain of the Greek 8,000-tonner referred to in the above table receives £26 a month, or 30s. a month less than the master of the British 6,600-tonner. The other wages compare as follows:

Greek steamer.	British steamer.
Mate, £20 a month, Second mate, £16 a month.	Mate, £20 10s. a month. Second mate, £16 10s. a month.
*Chief engineer, £25 a month. Second engineer, £20 a month.	Chief engineer, £23 10s. a month. Second engineer, £20 10s. a month.

*A Britisher.

The third engineer on each vessel receives the same wage, but, while no fourth engineer is carried in the Greek boat, one is employed in the British steamer. The Greek boat's seamen and firemen are paid £2 to £3 per month less than the Britishers, and the steward £4 10s. a month less, while a mess-room boy receives £4, against £8 10s. paid to a mess-room steward on the British boat. These figures obviously speak for themselves.

How Great Britain Proposes to Equalize Matters

Reverting to the general position apropos foreign competition, two proposals have been put forward in United Kingdom shipping circles with a view to equalizing matters. The first of these suggestions is that the union leaders of the seamen should propound a scheme to enable British shipowners to operate the vessels at present laid up or to be laid up, the seamen to accept lower wages—but not so low as on the Greek boats cited, but more nearly representing the pre-war wage, plus the increase in the cost of living. The second proposal is that the government, without infringing on the principle of Free Trade, should tax foreign steamers to the extent of the difference in the rate of wages paid on the respective British and foreign boats.

Proposal for Government Credits for Building Motorship Tonnage Unfavorably Received

A suggestion that the British Government should grant credits to shipowners in connection with the building of motorship tonnage has excited attention in shipping circles, but, judging from its reception, its author might well have left the subject alone, thus saving himself time and thought. He urged that, with the larger volume of motorship tonnage which British shipowners will eventually require, if they are to hold their position in the sea carrying trade, the government should place national credit at the disposal of the shipowners. This, of course, was a direct invitation to the government to take a hand in the future conduct of the British mercantile marine, and, frankly, the British shipping community has expressed its unqualified disapproval of any such course being adopted.

A leading shipbuilder fears that the proposal would not be likely to provide a great deal of employment for shipbuilders in the near future. No doubt, he says, the transition from steam to internal combustion engines will come about in time, but it will be a slow and gradual process. "Internal combustion engines," says this authority, "are still in a large measure in the experimental stage, and shipowners will not, I imagine, be prepared to embark on extensive programs until they feel more sure of their ground."

A shipowning expert, in voicing his doubts as to the practicability of the proposal, cites the Chamber of Shipping view that shipping should be left alone to develop along its own lines.

Sir Alfred Yarrow Says Tramp Vessels Destined to Be Motorships

Touching on the internal combustion engine, Sir Alfred Yarrow, the famous shipbuilder, states, with regard to Diesel engines, that there is not the slightest doubt that, as long as the oil supplies of the world last, engines of this type will replace those of steam in tramp steamers and other vessels of the same character. In the first place, he says, owners will be inclined to use Diesel engines to maintain a more efficient and cheaper service, and, secondly, because the space and weight saved by carrying less oil fuel gives increased facilities for carrying greater quantities of cargo. Sir Alfred Yarrow thinks that there is also a future for oil engines in passenger ships, but, as for a vessel of the *Berengaria* type, he considers it will be a long time before they have that means of propulsion. Perhaps his most interesting view, however, is that, within the next twenty years all "tramp" steamers will be running on Diesel engines, unless there are any new discoveries in the intervening time. There is, he thinks, the possibility that, if oil fails to last, owners will have to increase their prices for freight—"which would be a big drawback all round"—but he is of opinion that, for steamers of eleven or twelve knots, the Diesel engine is ideal.

Comparative Operating Results of Motorship and Steamer

To pursue the question of the advantages or disadvantages (if any) of Diesels, striking comparisons have been drawn here between the operating results of a Diesel-engined vessel, an oil burner and a vessel burning coal. An analysis of these three types of vessels indicates to a marked degree that the balance of profit is decidedly in favor of the vessel driven by Diesels—not, of course, on all voyages, but on those where long distances have to be covered.

The case is quoted of a Diesel-engined vessel which has completed a round voyage occupying more than 160 days. During this period her average daily profit was approximately £4, which, on the surface, is in all truth a small amount, but is, in fact, considerably in excess of the sum gained by vessels of other types. Thus, the receipts of an oil burner would have been reduced by rather more than 6 percent owing to cargo being shut out, and, allowing for minor advantages, such as lower disbursements and reduced insurance premiums, the net result of this oil burner's voyage would be a loss exceeding £3,000, or about £19 per day. The coal-burning steamer's voyage would compare even more unfavorably with the Diesel boat. The larger amount of coal carried would reduce the gross freight by 9.61 percent, and finally the round voyage would show a loss of about £7,400, or nearly £47 per day. To sum up, therefore, the oil-burning steamer would lose nearly £7,000 in a year and the coal burner at the rate of £17,000, while the Diesel vessel would earn the small, but acceptable, profit of £1,460 per annum, ignoring, of course, depreciation or capital interest.

On the general question of Diesels, the big question remains the extra initial cost of construction. Statistics such as those cited above would seem to show that this greater first cost to build is well worth while; but shipowners are not so sure about it, and, frankly, they will take a deal of convincing.

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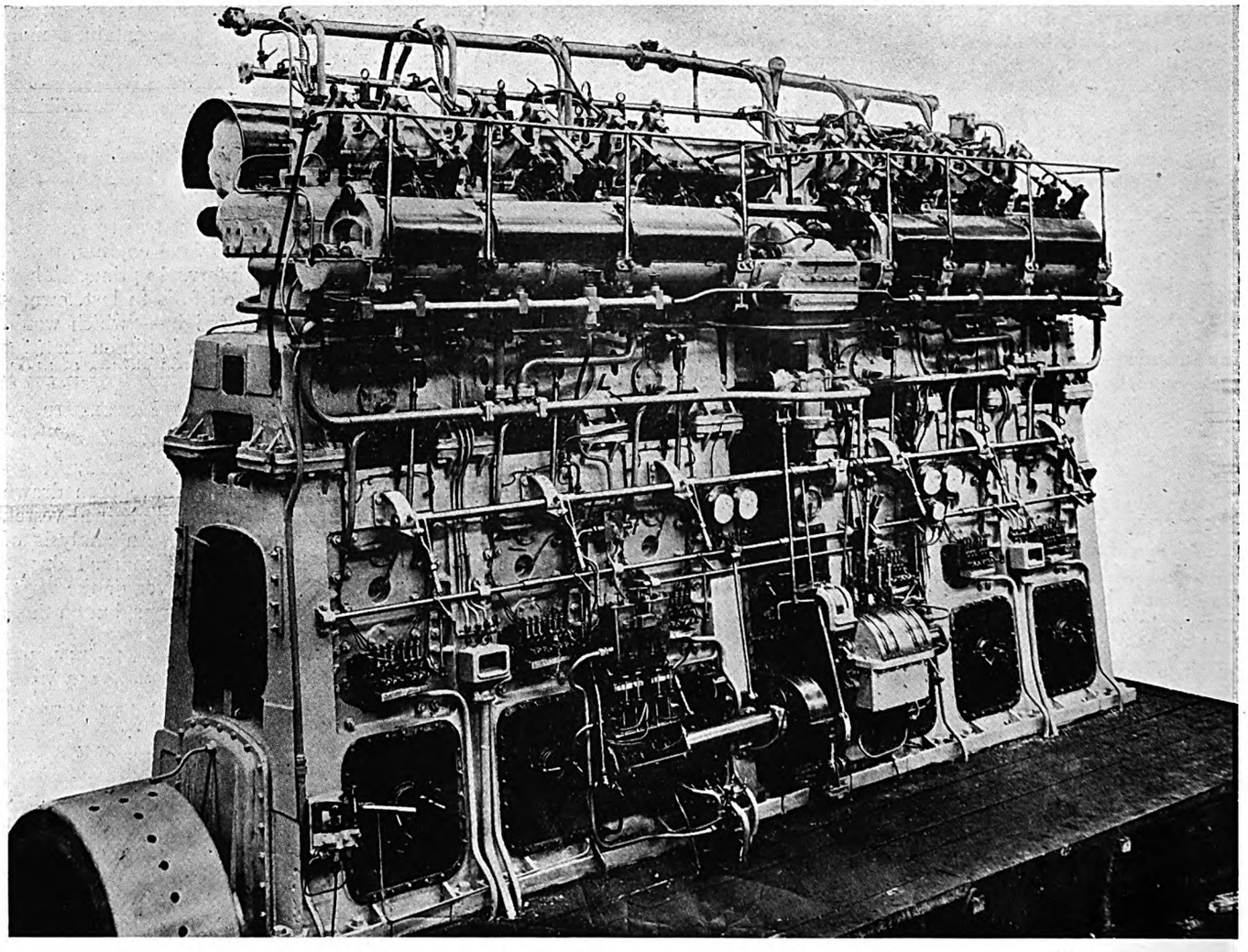
First British-Built Diesel Electric Ship Completes Trials

The Fruit Carrier La Playa Is Equipped with Four Camellaird Fullagar Units — New Vickers and Sulzer Oil Engines

By Our Special London Correspondent

IT cannot be said that European shipowners are very favorably disposed towards the adoption of Diesel electric propulsion. Their general opinion is that this involves additional complication, with the result that upkeep costs are higher, and a larger engine room staff may be needed. They fear moreover that the price of the machinery would be high, and they have a conservative objection to the employment of fast running Diesel engines coupled to generators.



New Standard 600 Brake Horsepower Vickers Oil Engine

They therefore prefer the slow-running Diesel motor, direct coupled to the propeller shaft, and are not greatly impressed with the claim of the advocates of the Diesel electric system that reliability is increased, since the power is distributed over several units instead of one, or, at most, two.

Motorships Building in Europe for American Owners

Nevertheless, the greatest interest has been evinced in the new Diesel electric ship *La Playa* which has just been completed at Cammell Laird's yard at Birkenhead and has run a series of very prolonged trials. It is significant, however, that this vessel, which is the first of three sister ships, is to the order of American owners, namely the United States Fruit Company of Boston. Incidentally, it is somewhat curious to note how many of the recent motorship orders placed either directly or indirectly on behalf of American interests are being executed in European yards. In addition to the three craft mentioned, the Pacific Mail Steamship Company has two passenger and cargo motorships on the stocks at Gothenburg, the Standard Oil Company has ordered motor tankers from Krupps, two 20,000 ton ore carriers, now being built in Germany for Mr. Dan Brostrom, the Swedish shipowner, will be operated on behalf of the Bethlehem Ore Company, while two other motor cargo ships now being constructed in England are for an American concern.

Diesel Electric Ship Has Greater Cargo Space

The *La Playa* is in many respects a remarkable vessel, and probably represents the most interesting example of Diesel electric propulsion that has yet been seen in any country. She is designed essentially for fruit carrying, has a capacity of 5,000 tons and has the relatively high speed of 14 knots,

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speed being of course such an important factor in ships engaged in this trade. The length is 325 feet, the beam 48 feet, and the depth 31 feet 9 inches. The striking claim is made that in spite of the fact that four generating units are installed, there is actually larger cargo carrying space in this ship than in an ordinary motor vessel, mainly on account of the fact that there are no long propeller shafts and shaft tunnels between the main engines and the propellers.

Fitted in the engine room are four Diesel driven dynamos of 500 kilowatts each, the engines being of the four cylinder Camellaird Fullagar opposed piston type, each developing 750 brake horsepower and having cylinders 14 inches in diameter, with a combined piston stroke of 36 inches. They run at the fairly high speed of 250 revolutions per minute, being thus very much lighter than the normal slow speed marine direct coupled type. This accounts for the fact that there is very little difference in the machinery weight of this ship as compared with a normal motor driven vessel.

Generators

Each engine actually drives two dynamos, for in addition to the main generator previously referred to, there is an auxiliary of 200 kilowatts output. These auxiliary dynamos supply the necessary power for auxiliary purposes, since electrical machinery was used throughout and there is no boiler on the vessel. It might be thought that four auxiliary generating sets developing a total of 800 kilowatts represents an excessive amount, but the demands for the refrigerating plant are very heavy and are estimated at some 500 horsepower. This is all provided from the auxiliary generators, so that there is no necessity to install auxiliary Diesel driven dynamos which is the usual arrangement of a motor vessel.

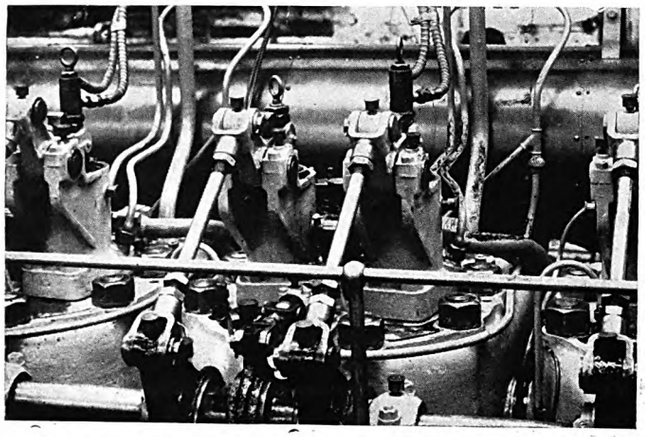
Direct current transmission is adopted but the main generators, each operating at 220 volts, being coupled in series thus supply current at 880 volts to the 2,500 brake horsepower electric motor, which is direct coupled to the propeller. Speed control and reversal are accomplished by varying the stroke and direction of excitation of the fields of the main generators, and normally the propelling motor runs at 90 revolutions per minute.

Vickers Brings Out a 600 Horsepower Diesel

Although most of the leading British Diesel engine manufacturers concentrate their attention on the construction of motors of 1,000 brake horsepower and upwards, in one or two cases types of smaller power are standardized, as it is thought there is a field for engines of 500 to 600 brake horsepower for installation in small vessels, such as coasters and similar craft. It is with this object in view that Vickers have just brought out a new standardized model of 600 brake horsepower in six cylinders, and the first example is being fitted in a small mixed cargo and passenger vessel recently built for Japan. This is all the more interesting as it indicates competition between Diesel and semi-Diesel engine builders, since motors of the latter class are now being constructed up to 600 brake horsepower as instanced in the Beardmore and Kromhout designs which have already been described in this journal.

The latest Vickers engine is a pure Diesel with their well-known system of solid injection. It has cylinders 18¼ inches diameter and 27 inches stroke, and the speed is 150 revolutions per minute. It must be admitted that at first sight it appears somewhat complicated in comparison with a semi-Diesel as it has all the accessories, the valve gear and reversing mechanism of a Diesel motor five or six times the power.

There is a set of fuel pumps seen on the left of the control station, delivering fuel to the fuel valves at 4,000 to 5,000 pounds per square inch, one of which is located in each cylinder cover. The speed is controlled by altering the lift of the fuel valves, this operation being carried out by means of a lever at the control station. Starting is by compressed air in the usual manner, and ahead and astern cams are mounted side by side on the camshaft which is moved longitudinally by an air servo motor when it is desired to reverse the engine. The exhaust valves are water cooled and the valve levers are all pivoted eccentrically on a layshaft which

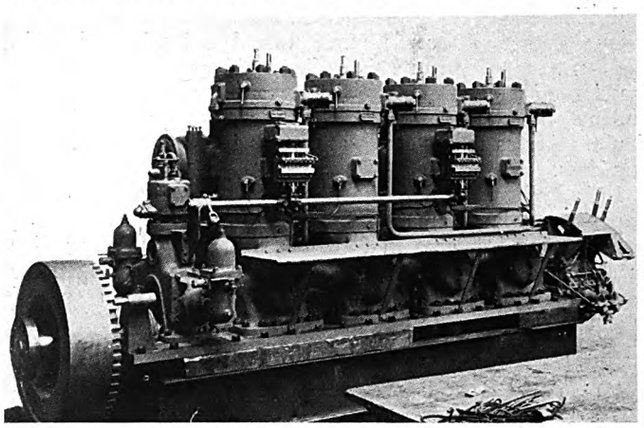


Valve Gear of One of the Cylinders of the New Vickers Engine

is turned before reversing, thus lifting the rollers of the valve levers off the cams before the camshaft is moved.

A New Sulzer Design

In the hope of lowering the cost of production, Sulzers have lately been engaged upon the development of an entirely new design of Diesel engine adapted mainly for low powers. At present, the motor is built only in sizes up to about 300 brake horsepower but there is the possibility of the same system being utilized for larger engines as the results have been



The New Sulzer Valveless Diesel Engine with Crank Chamber Compression

exceptionally good. In the engine illustrated, it will be noted that there is no air compressor and all valves are eliminated.

The motor operates on the two cycle principle and the smaller size has crank chamber compression for scavenging, although in bigger sets, separate pumps can be utilized, and this would, no doubt, prove more satisfactory. The fuel is delivered from a low pressure mechanical pump through an automatic atomizer into an ignition chamber in the cylinder cover. This injection takes place some time before the piston reaches the top dead center.

As the air is compressed on the upward stroke, it enters the ignition chamber through a comparatively small hole, connecting it with the combustion chamber. Partial ignition results, raising the pressure in the ignition chamber and this causes the whole of the fuel therein to be forced into the combustion chamber. The air mixes with the compressed

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air and combustion takes place as in a normal Diesel motor. On the downward stroke, the exhaust gases are discharged through exhaust ports and scavenging air enters through ports at the bottom of the cylinder uncovered by the piston. It is specially worthy of note that the fuel consumption of this engine is about 0.42 pound per brake horsepower hour when running on Diesel oil, a result almost equivalent to that of the best present-day Diesel engine of large power.

Insurance Companies Hard Hit by Japanese Disaster

Early Reports of Marine Losses Greatly Exaggerated—New York Marine Insurance Men Appoint Committee to Handle Japanese Problem

By "Bordereaux"

THERE are few prominent insurance companies in the world that will escape the payment of losses on account of the recent earthquake and fire in Japan. Companies are responsible for the effects of earthquakes and tidal waves, under their regular marine contract, as these are clearly so-called "acts of God." It is likely that a year or more will elapse before satisfactory proofs of loss can be presented to the respective insurers. There still remains a great deal of uncertainty as to the extent of the disaster, but it is generally felt, from the more recent advices received by underwriters, that early reports of marine losses were greatly exaggerated. Only two or three hulls were lost in Yokohama or along the coast; a large number of small craft were in the harbors and inside the breakwaters when the first earthquake shocks were felt and most of the loss incurred as respects hulls was on their account.

Modern massively constructed warehouses along the water front at Yokohama were controlled by Japanese customs officials, and in these the bulk of freight awaiting shipment, and dischargeed from vessels, is normally found. It is presumed that all records, governmental and private, kept in the Customs Compound have been destroyed. The exact location of any shipment will be a matter of uncertainty and may possibly never be determined beyond a shadow of doubt. Access to customs warehouses in Japan is denied to outsiders.

It is understood that the principal marine companies in Japan wrote large amounts for their own nationals and that those having branches in foreign countries were very active in shipments to and from the Japanese Empire. There are now more than forty companies of Japanese writing a general marine business. Cable advices to the *Nippu Ji Ji*, a Japanese newspaper in Honolulu, says the entire insurance losses in the earthquake zone will total about $1,100,000,000. Of this sum eighty percent will be paid by the government and twenty percent by the insurance companies.

Steamers entering the Yokohama harbor are making extensive soundings because of the recent upheaval of the sea bottom. It is thought that it will be necessary eventually to make soundings for forty-five miles out, if the true condition of the bottom is to be known. For a considerable time after the earthquake Yokohama harbor remained inaccessible to vessels of the draft of those of the Canadian Pacific Line.

New York marine underwriters have been receiving requests from bankers and shippers that insurance policies or certificates of insurance be amended to cover to original port of destination or to any port in China or Japan to which goods may be diverted because of possible congestion at the intended port of discharge. This was the result of rumors reaching the United States of congestion in Japanese ports. Steamship lines are preparing to handle an abnormally large amount of freight and the Far Eastern Conference has met to discuss the situation brought about by the earthquake. A message has been received from Osaka to the effect that the Navy Department will soon be busily engaged in scrapping a number of government vessels the material from which is to be used for reconstruction work at Tokio.

Most marine policies cover from warehouse to warehouse, and this doubtless means that the underwriters will sustain serious losses on cargo that was in transit at the time of the disaster. On the other hand, unless special provision was secured from the underwriters, goods delayed in local warehouses known as "godowns" will not be covered beyond a limited period. The earthquake clause is written in most of the policies in effect in Japan, and under it the underwriters are free of liability resulting from earthquakes. In general there is doubtless considerable merchandise still in warehouses in Japan under shore-end cover, and because of the general situation marine insurance men in New York recently met and appointed a special committee to handle the Japanese problem and to arrange to have competent salvage men on the ground as soon as possible.

Bonded Warehouse Pilferage

MARINE insurers are watching with interest and satisfaction the commendable enterprise that is being shown by the Merchants Association of New York, through its foreign trade bureau, in endeavoring to bring about a settled determination of the responsibilities for merchandise lost in bonded warehouses. The ordinary marine policy covers from warehouse and shipper to warehouse and consignee. However, if goods are placed in storage in a bonded warehouse, the marine insurance coverage would terminate, but, if the goods are held in such bonded warehouse for a temporary period and upon being delivered to consignee are found to have been pilfered, the question immediately arises as to where the pilferage occurred; that is, whether on the voyage or after the arrival of goods in the bonded warehouse. This is important to the underwriter because the pilferage bill would be put up to him.

Trade With Turkey

THE restoration of peaceful conditions in Turkey and quiet progress there toward the establishment of a republic are being watched by marine underwriters with great interest as indicating to them the probable revival of trade between that country and the United States. Hope is frankly expressed that, if such a revival should take place, improvement will be made in handling goods at the port of Constantinople. At present underwriters are confronted with heavy claims for damage on shipments to that port. This is particularly true as respects shipments of food stuffs, such as flour, sugar, etc. Apparently the goods are permitted to remain on lighters and in the open on shore for considerable periods exposed to the elements. This results in damage for which the underwriters have to be responsible. Insurers are also complaining that they do not receive fair treatment in connection with the adjustment of losses at Constantinople.

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Questions and Answers Relating to Naval Architecture and Marine Engineering

Conducted by James L. Bates, Naval Architect, and W. B. Newton, Marine Engineer

This department is maintained for the purpose of answering all questions relating to ships and their machinery. All inquiries should bear the name and address of the writer. Anonymous communications will not be considered. The identity of the writer, however, will not be disclosed unless the editor is given permission to do so.

Weights of Fuel Oils

Q. (1,220).—Will you kindly furnish me with the weights per cubic foot or per gallon of the following oils for marine engines—gasolene, kerosene, oil for heavy oil engines, Diesel oil and marine boiler oil? N. L. S.

A. (1,220).—The following figures represent average conditions closely:

Oils	Cubic feet per ton	Gallons per ton	Pounds per cubic foot
Gasolene, boat	49	366.5	45.7
Gasolene, aviation	50	374.	44.8
Kerosene	44	329.1	50.9
Fuel oil (boiler)	40	299.2	56.
Diesel engine oil	42	314.	53.
Lubricating oil	38.5	288.	58.2

So-called heavy oil engines should use ordinary boiler fuel oil satisfactorily.

Diesel engines are capable of burning boiler fuel oil but this is generally unsatisfactory.

Fuel Consumption Problem

Q. (1,221).—A ship making 10 miles an hour makes 1,500 miles on 200 tons of coal. How much coal would be required for the ship to go 1,200 miles making 6 miles an hour?

A. (1,221).—At 10 miles the ship runs $\frac{1,500}{10} = 150$ hours on 200 tons.

This is then $\frac{200 \times 2,240}{150} = 2,990$ pounds per hour.

Assume a consumption of 2.5 pounds per horsepower per hour. Then the horsepower is about 1,200.

Assume a cargo ship 288 by 40 by 18.25 by 4,500 which would be reasonable for such a machinery installation. The power at 6 miles may be taken* at ⅓ that at 10 miles, call it 400. The coal consumption at this power would be roughly 5 pounds per horsepower per hour. Hence she would consume per hour:

$$5 \times 400 = 2,000 \text{ pounds} = 0.893 \text{ ton}$$

1,200 miles at 6 miles requires 200 hours,
therefore tons of coal required are $200 \times 0.893 = 178.6$, say 180 tons.

*Propulsive coefficient taken as 85 percent that at 10 knots.

Comparative Fineness of Afterbody of Submarine and Destroyer

Q. (1,222).—Please compare the fineness of the after body of an ordinary submarine with that of destroyers or light cruisers.

A. (1,222).—It is somewhat difficult to convey a correct idea of the fineness of an under body without lines and curves of areas of section, which are, of course, impracticable to furnish.

A sufficiently accurate idea for your purpose may perhaps be obtained through the value of the prismatic coefficient of the after bodies in each case. The values of this coefficient in recent light cruisers and destroyers are about 0.63 to 0.64. For a modern submarine the corresponding figure is 0.54.

Effect of Joggling of Frames

Q. (1,223).—What can you say of the joggling of frames as to the effect on weight, strength, cost of construction, etc.?

A. (1,223).—The joggling of frames consists in the offsetting of the frame in way of outside strakes so that the frame bar fays against the inner surface of the strake. Joggling is done cold in a press before the frames are bent.

By joggling frames, liners are eliminated and their weight saved. This weight may amount to about 3½ or 4 percent of the weight of the shell plating. Joggling may be done in frames or deck beams up to a depth of section of 12 inches. Joggled frames, however, are generally hand beveled and this is a disadvantage at the ends of a ship, if the framing is heavy, as the work of beveling becomes very laborious.

The strength of the shape is decreased by joggling but the loss is immaterial.

The advantage of joggling from the standpoint of cost lies in the saving in punching and riveting and in the reduction of the number of pieces to be handled. The actual amount of the saving will depend somewhat on the character of the vessel and the facilities of the shipyard.

Power Required to Drive Vessel

Q. (1,224).—Please tell me how much power I will require to drive a vessel 200 feet by 25 feet by 7 feet draft at a speed of 16 knots.

A. (1,224).—The writer has received similar questions to the above on a number of occasions and has been unable to give a satisfactory answer because the inquiries contained insufficient information. There should be furnished, in addition to that given above, the displacement and the prismatic, midship section or block coefficient. Otherwise no idea of the fineness of underbody or the displacement relative to the length is obtainable.

It is possible to have an infinite number of displacements on the same length and beam. For example, examine the following table:

	Length	Beam	Draft	Displ., Tons	Speed, Kts.	Eff. Hp.	Speed, Kts.	Eff. Hp.
Case 1	200	24	5.5	305	15	335	18	755
Case 2	200	24	6.6	406	15	480	18	980
Case 3	200	25.5	6.25	500	15	470	18	1,110

Cases 1 and 2 are for the same vessel at different drafts, while Case 3 is for a different vessel. Note that the displacement—length coefficient $\left(\text{displacement} \div \frac{(\text{length}^3)}{100}\right)$ is 62.6 in Case 3 and but 38.1 in Case 1, while the block coefficients are 0.55 and 0.405 respectively. Note also that the effective horsepower at 15 knots is about the same for Cases 2 and 3 while for 18 knots Case 3 requires a good deal more power than Case 2.

The vessels referred to above are suited to relatively high speeds. The following is an instance of a vessel of similar

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dimensions but of a very different type and intended for very low speeds:

	Length	Beam	Draft	Displ., Tons	Speed, Kts.	Eff. Hp.
Case 4	200	25	6.5	715	10	200

It would probably be impracticable to put sufficient power in a hull of this type to get a speed of even 15, to say nothing of 18, knots.

LETTER TO THE EDITORS

Combined Riveting and Welding

NORFOLK, Va.

TO THE EDITORS:

Referring to the editorial in your July issue and the letter of N. G. Near in the September issue under the above heading, the writer considers that the reinforcement of riveted joints by the use of metal arc welding would be good practice when it is necessary to increase the strength of existing riveted joints as in the case of the conversion of the battleship *Kearsarge* into a seagoing crane ship, on the other hand the use of metal arc welding to reinforce a riveted joint in new construction would, in general, indicate a lack of faith in both methods of joining metals.

The calculated maximum possible efficiency of any riveted joint is 89 percent as given in the specifications of the United States Navy, and experiments with riveted connections indicate that the loads at which riveted joints begin to open are very much lower than the ultimate strength of the joints.

A lap joint made by an electric arc welder, selected on the same basis as a first class riveter, will invariably fail outside of the joint, if a full fillet weld is made on both edges of the lap. Furthermore it is possible to reinforce both of these fillet welds, thus further insuring that the joint will not fail in the weld. With such assurance there appears no justification for weakening a lap joint by the use of rivets.

Tee, open butt strap, corner butt, and joggled lap (provided the fillet weld on the flush side is not made in the joggle) joints can also be depended on to give 100 percent efficiency, if the proper amount of filler metal is deposited in the weld. This assurance cannot be had for double-bevel or double-vee butt joints, without careful attention to many factors on which the strength of such joints depend, *e.g.*, carbon content of the steel, sequence of welding, reinforcement of the weld, etc., and for this reason it would be better to avoid, at least for the present, the indiscriminate use of these joints in ship construction and repair. When such joints are used they should be reinforced by a strap.

The future application of welding to ship construction, to the exclusion of riveting, is contingent on a thorough knowledge of the factors on which the strength of the welded joint depends, and unless these factors are clearly understood, it will be quite possible to weaken a riveted joint by the use of welding. The writer believes the time will come when it will be thought as unnecessary to test a metal arc welded joint as it is now considered unnecessary to test a brick wall.

Relative to N. G. Near's desire for tests on combined riveted and welded joints, it is believed that such tests conducted by the Quasi Arc Company in England and those conducted by William T. Bonner during the war, the latter of which are given in the "Report of the United States Shipping Board of the Emergency Fleet Corporation on Electric Welding" by Captain James Caldwell, R. E., 1918, will give a clear indication of what can be expected of such a combination.

JAMES W. OWENS, Electrical Engineer, Norfolk Navy Yard. In charge of Welding Research for the Bureau of Construction and Repair of the United States Navy.

NEW BOOKS

The International Combustion Engine

THE INTERNATIONAL COMBUSTION ENGINE (Two volumes). By Harry R. Ricardo, B. A., A. M. I. C. E., M. I. A. E. Size 6½ by 9¾ inches. Volume I—Slow Speed Engines: Pages, 488. Illustrations, 215. Volume II—High Speed Engines: Pages 373. Illustrations, 225. New York, 1923: D. Van Nostrand Company.

This work is built upon generous lines. The thermodynamics of the internal combustion engine is treated at length, and the application of the various types of engines to stationary practice, aeroplanes, motor cars and the multitudinous uses to which gas engines and similar motors are put is described in detail.

For the shipbuilder and those concerned with marine affairs, however, the book appears to us somewhat disappointing, as the development of the marine Diesel engine, up to the present time, has been greater and is now proceeding more rapidly than one is led to believe by a perusal of its pages. There is in the book no adequate treatment of the Diesel as it stands today in relation to marine development and, in a modern and up-to-date work, this appears a rather serious omission.

For the designer of internal combustion engines the book contains much of interest and should prove a valuable addition to his bookshelf.

Sir Alfred Yarrow

ALFRED YARROW; HIS LIFE AND WORK. Compiled by Eleanor C. Barnes (Lady Yarrow). Size, 5½ by 8¾ inches. Pages, 328. Illustrations, 83. New York, 1923; Longmans, Green and Company.

The name Yarrow is a household word among shipbuilders the world over. There is possibly no man who has attained a greater prominence in the field of marine engineering and its allied arts during the past twenty-five years than Sir Alfred Yarrow. And this enviable and deserved position is but the natural result of signal ability coupled with hard and conscientious work.

Entering the engineering profession as an apprentice at the age of fifteen, Yarrow's inventive and constructive genius carried him forward by leaps and bounds. His first serious invention was a steam plough, patented more than sixty years ago. This was followed by a steam carriage capable of making twenty-five miles an hour.

After that, he turned his attention to the sea, and in 1868 his first steam launch was delivered. From that time on Yarrow's work, as exemplified by his torpedo boats and destroyers, the Yarrow boiler, his development of the science of balancing reciprocating engines—all is well known to the members of his profession.

All this is interestingly recorded, if in a somewhat fragmentary manner, by Lady Yarrow in the biography under review. The book also gives another side to the picture, perhaps not so generally known—the life story of a kindly, lovable and public-spirited gentleman.

The History and Problems of the International Seamen's Union of America

The account of the organization and activities of the International Seamen's Union of America published by the Bureau of Labor Statistics of the United States Department of Labor as Bulletin No. 342 records the efforts of the union over a long period to change the laws of contract relating to seamen.

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PERSONAL MENTION

T. S. ROSSBOTTOM has been appointed general manager of the United States Lines in charge of operations.

R. D. YAUCH has been appointed manager of the allocation department of the United States Shipping Board at Washington.

U. J. GENDRON has been appointed manager of the contract department of the Shipping Board with headquarters at Washington.

WILLIAM J. LOVE has resigned as general manager of the Emergency Fleet Corporation to accept the appointment of managing director of the United States Lines.

ALFRED WELLER, formerly assistant to M. A. Kerwin, traffic manager of the Colombia Steamship Company, has been made traffic manager of the company, succeeding Mr. Kerwin.

W. O. HAINES, who has been connected with Norton, Lilly and Company on the Pacific coast staff, has been appointed superintendent at Portland, Ore., for the company's Pacific port service.

CAPTAIN R. D. GATEWOOD, director of the Bureau of Maintenance and Repairs, United States Shipping Board, is in Europe inspecting facilities for the repair of Shipping Board vessels.

FRANK T. LORD of New York was recently named as one of Chairman Farley's aides in the United States Shipping Board. His title is assistant to the president of the Emergency Fleet Corporation.

J. B. SMULL, former president of the Emergency Fleet Corporation, is now actively participating in the business of J. H. Winchester and Company, ship brokers at 17 Battery Place, New York.

E. C. MORSE has joined the organization of the Triumph Electric Company and the Triumph Ice Machine Company, Cincinnati (Oakley), Ohio, as vice-president in charge of sales and member of the board of directors.

COL. R. H. HALLETT, formerly of the legal division of the United States Shipping Board, is now acting as assistant to Chairman Farley. Col. Hallett was at one time assistant director of the Bureau of War Risk Insurance.

F. S. B. HEWARD has joined the board of the Canadian Combustion Engineering Corporation, Ltd., representatives in Canada of James Howden and Company. Mr. Heward still retains his connection on the executive board of the latter company.

M. A. KERWIN, formerly traffic manager of the Colombia Steamship Company, has been appointed traffic manager of the Di Giorgio Fruit Corporation. In addition to this work he will also have charge of the freight and passenger vessels operated by Di Giorgio.

R. H. M. ROBINSON, president of the United American Lines, has severed his connection with the American-Hawaiian Lines, his place being filled on the board temporarily by V. H. Thun, treasurer of the company. A permanent director will be elected at the next meeting of the board to be held in San Francisco.

W. A. HARRIMAN has resigned as chairman of the board of directors of the American-Hawaiian Steamship Company, as a result of the separation of the affairs of the American-Hawaiian Line and the United American Lines, formerly under one management. Mr. Harriman will, however, continue as a member of the board of directors of the latter company. The office of chairman of the board has been abolished.

A. P. VILLAIN, formerly with the passenger department of the Canadian Pacific, has been appointed district passenger agent of the United States Lines at San Francisco, succeeding Theodore H. Jacobs, who was recently made Pacific coast passenger manager of the United American Lines.

E. S. BOGART AND W. P. RUDROW have become associated with the United American Lines in the inter-coastal department. Mr. Bogart was formerly claims agent for the American-Hawaiian Steamship Company and will act in the same capacity for the United American Lines, while Mr. Rudrow, formerly general freight agent of the North Atlantic and Western Steamship Company, will be east-bound freight agent for the United American Lines.

SIR ALFRED YARROW, the noted British engineer and shipbuilder who was a visitor in this country last month, prefaced his arrival with the interesting prediction that within twenty years all tramp steamers will be run by Diesel engines unless in the meantime some other invention is developed to supplant this method of propulsion. Although not a Diesel engine builder, Sir Alfred's opinions regarding this field of development command universal attention because of the accurate foresight which has characterized his exceptional career in the design and building of ships and propelling machinery. As early as 1868 Sir Alfred delivered his first steam launch to order. Since that time his progress of achievement has been marked by milestones such as the day when a torpedo was first mounted on one of his fast launches, the first appearance of the Yarrow boiler, and so on down to the world war when Yarrow boats came into their own.

Sir Alfred Yarrow

EDWARD P. FARLEY, chairman of the United States Shipping Board, sailed for Europe on the *Leviathan* on October 20 to make a complete survey of the foreign service of the United States Shipping Board and Emergency Fleet Corporation, located in northern Europe, and to attend the Transatlantic Passenger Conference to be held on November 7 in London. Mr. Farley will visit Great Britain and France and probably Germany, Belgium, Holland and Italy. He will return to the United States the last week in November.

GEORGE GORDON CRAWFORD, president of the Tennessee Coal, Iron and Railroad Company, has been appointed chairman of the dock commission to be in charge of the development of the port of Mobile, Ala., by Governor W. W. Brandon. The sum of $10,000,000 has been voted for the development of the port of Mobile, and it is intended that the dock commission, headed by Mr. Crawford, will be charged with the organization of the forces to map out and carry on the development work.

CAPTAIN E. M. TROTT, traveling superintendent of the United States Lighthouse Department, with headquarters at Tompkinsville, Staten Island, died recently at West New Brighton, Staten Island. Captain Trott was fifty-three years old and had been in the lighthouse service for more than twenty-five years.

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The Month's Shipping and Shipbuilding News in Brief

Shipyard, Steamship and Port Activities and Other Notes of Interest in All Branches of the Marine Industries

Old Dominion and Southern Pacific Companies Place New Ship Contracts Costing Close to Five Millions

A CONTRACT for the construction of two passenger and freight ships for the Old Dominion Steamship Line has been awarded the Newport News Shipbuilding & Drydock Company, of Newport News, Va., according to official information obtained by MARINE ENGINEERING AND SHIPPING AGE. Semi-official confirmation has also been received of the report that the contract for the construction of a new ship for the Southern Pacific Company has been placed with the Tacoma, Washington, plant of the Todd Shipyards Corporation. It is estimated that the two contracts will involve an expenditure of close to $5,000,000 and considerable interest attaches to the announcement as it follows on the heels of the placing of close to two and one-half million dollars' worth of new vessel construction by Standard Oil interests.

OLD DOMINION LINERS

The proposed Old Dominion ships are to be of the 3-deck, hurricane deck, coastwise type, 375 feet 6 inches in length by 53 feet beam and 29 feet 9 inches deep. Accommodations are to be provided for about 322 first class passengers, 58 steerage and 289 immigrants. The ships will have about 2,100 deadweight carrying capacity and will be propelled by Newport News Company Curtis turbine engines with Newport News single reduction gears turning single screws, steam being supplied by four Babcock & Wilcox watertube boilers, equipped with superheaters. The engines will develop about 4,750 shaft horsepower.

THE SOUTHERN PACIFIC SHIP

The estimates prepared for the Southern Pacific ship provided for a vessel having an overall length of 445 feet, 57 feet beam, depth to hurricane deck 37 feet 6 inches, draft 25 feet 6 inches, with a deadweight tonnage of 7,000. She is to be a single screw vessel, driven by double reduction geared turbines of 6,000 brake horsepower, steam being supplied by six oil burning watertube boilers at a pressure of 250 pounds. The ship is to be fitted to carry about 237 first class and 111 steerage passengers.

U. S. Cruiser Marblehead Successfully Launched at Philadelphia Yard

THE *Marblehead,* the fourth of five light cruisers built or now building at the plant of the Wm. Cramp & Sons Ship and Engine Building Company, in Philadelphia, was launched on October 9.

The hull is 555 feet 6 inches in length over all, 550 feet between perpendiculars and 55 feet in breadth at load waterline. With a designed speed greater than 35 knots, the vessel has a trial displacement of about 7,100 tons with a mean draft of 13 feet 6 inches. At full load the draft will be over 15 feet.

PROPELLING MACHINERY

Propulsion is by four propellers, each driven through reduction gearing by cross-compound Parsons turbines, and, in addition, geared cruising turbines are provided for additional economy at speeds of 20 knots and below. At maximum power the main turbines are capable of developing 100,000 shaft horsepower. Steam is supplied by 12 express type watertube boilers, burning oil fuel.

The main battery consists of twelve six-inch 53-caliber rapid fire guns. The secondary battery consists of two three-inch 50-caliber anti-air-craft guns and two three-pounders. Two triple and two twin above-water torpedo mounts are also provided.

Sun and New York Shipbuilding Companies Awarded Contract for Five and Three S. O. Diesel Oil Barges

THE Sun Shipbuilding Company, of Chester, Pa., and the New York Shipbuilding Company, of Camden, N. J., were the successful bidders for the construction of Diesel-engined oil barges, proposals for which were received by the Standard Transportation Company, a subsidiary of the Standard Oil Company, on Thursday, September 27. The Sun Company has been awarded the contract for five of the vessels and the New York shipbuilding plant, three. Although official figures were not given out, it is understood that the larger contract will involve close to $1,500,000 and the other about $900,000.

The new vessels are to be similar to those previously constructed by the Sun Company and according to specifications are to have a length overall of 260 feet, beam molded 40 feet, draft molded 14 feet, and constructed with nine oiltight bulkheads. Each vessel is to have a capacity of 13,500 fifty-gallon barrels of oil on a 12-foot draft.

The main propelling machinery will consist of two 300 brake horsepower, 6-cylinder, 4-cycle, direct reversible, air injection, Diesel oil engines, turning twin screws.

American Bridge Co. Gets $269,250 19-Barge Contract

THE Chief of Engineers, Washington, D. C., has awarded to the American Bridge Company, Pittsburgh, Pa., a contract for the construction of 19 steel barges, 15 to be constructed with cargo boxes at a cost of $215,250, and four without cargo boxes at $54,000, involving a total of $269,250.

The boats are for the District Engineer Office, Louisville, Ky., and are to have a length of 110 feet, beam 26 feet, depth 6½ feet. Bids for the work were opened at Louisville on September 11, the American Bridge Company being the low bidder.

Word comes from the Union Shipbuilding Company, Baltimore, Md., of the company's reorganization of their Repair Department.

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Steamship Owners Urge Revision of Navigation Laws

PRESIDENT Alfred Gilbert Smith of the American Steamship Owners' Association has completed the selection of a special committee of practical ship managers and operators to prepare a thoroughgoing revision of the navigation laws and rules of the United States, including the La Follette Seamen's Act and the laws and rules of the Steamboat Inspection Service. This committee from the Shipowners' Association will seek the active cooperation of the Department of Commerce and the Shipping Board.

The committee as selected by President Smith is as follows: Captain Eugene E. O'Donnell, manager of the marine department of C. H. Sprague & Son, of Boston, chairman; J. D. Tomlinson, vice-president of the American-Hawaiian Steamship Company; David T. Warden, manager of the marine department of the Tide Water Oil Company; A. J. McCarthy, manager of the American flag steamers of the International Mercantile Marine Company, and Robert F. Hand, assistant manager of the marine department of the Standard Oil Company of New Jersey.

Captain O'Donnell, Mr. Warden and Mr. Hand were among those who participated in the inquiry of the special committee created several years ago by the Shipping Board to make a study of the navigation laws and rules. This former committee included representatives of the seagoing officers and men, and was headed by P. A. S. Franklin, president of the International Mercantile Marine Company. Its work will be a foundation for the present inquiry. The purpose is to have definite recommendations in hand in time for consideration at the coming session of Congress.

Great Lakes Engineering Works to Build One of Ford Ships

THE Great Lakes Engineering Works, River Rouge, Mich., has been awarded the contract for one freight ship for the Ford Motor Company, of Detroit, Mich., according to official information received by MARINE ENGINEERING AND SHIPPING AGE. It is understood that the proposed vessel will have an overall length of 611 feet and be propelled by Diesel engines. Bids for the hulls were taken recently and it is reported that the contract for the second ship has been placed with the American Shipbuilding Company.

Details regarding the construction of the vessels and their equipment have been withheld by the Ford Company.

New Steamer is Under Consideration By Matson Line

ACCORDING to a recent statement by E. D. Tenney, president of the Matson Line of San Francisco, the construction of a new liner with speed enough to make the run from San Francisco to Honolulu in four and a half days is being considered by the officials of the company. The fastest of the company's liners now makes the trip in five days, twenty-two hours.

New Contracts

SEVEN and a half million dollars worth of new vessel construction, a large portion of which has been listed as "pending" for many weeks, has been placed and the maritime industry looks ahead with renewed courage. One of the outstanding features of the awarding of contracts for eleven ships, eight for the Standard Oil Company, two for the Old Dominion Steamship Line and one for the Southern Pacific Company, is the significance attending the building of the oil boats.

Businessmen point out that when the downward trend of affairs is apparently at its worst and the outlook is the blackest, the Standard Oil interests come into the market and buy. For this great purchaser to order, at this time, eight Diesel-propelled, seagoing carriers is taken as an indication that prices are not going lower and NOW is the time to place new contracts.

With these three companies, representative of the nation's leading financial leaders, coming into the marine market at present augers well for the future of American shipping. Further, the placing of this new constructive work in four different shipyards in different parts of the country sounds a cheering note for the employment of heretofore idle hands—and is not without its bright side for equipment manufacturers.

There are other contracts still under contemplation. If the events of last month are a criterion, and if any faith can be pinned to the judgement and foresight of our big business men, additional contract awards are coming in the not far distant future.

Survey Reports 356 Shipping Board Vessels Available for Conversion to Diesel Ships; Repair Needs Shown

CHAIRMAN FARLEY of the Shipping Board has made public the report of the Board's Fleet Survey Committee, composed of Commissioners O'Connor, Chairman, and Commissioners Benson and Plummer. This Committee has been working for months to obtain the data upon which the report is based, and it covers a complete record of the laid-up fleet, and also divides the fleet into various qualifications as to type, condition, and economy of operation. The following sub-divisions have been made:

SURVEY RESULTS

Class A. 427 steel vessels. Composed of steel of good design, well built, with reliable machinery and deck auxiliaries, capable of continuous operation with normal up-keep. Not requiring in excess of $35,000 for repairs.

Class B. 177 steel vessels. Of the same as Class A, but requiring repairs and overhauling in excess of $35,000 each. This expenditure would allow either a greater amount of repairs and overhauling on the replacement of faulty deck or engine room auxiliaries or renewals of gears, etc., which would bring them in Class A.

Class C. 84 steel vessels. Good type and well built hulls in fair state of preservation, but less desirable than A and B, by reason of unreliable and uneconomical machinery, which, however, could be replaced with reliable and economical equipment at cost of not to exceed $100,000 per ship.

Class D. 356 steel vessels. Includes vessels of good design and competive type but fitted with machinery that will require extensive renewal in varying degree, and are desirable hulls for conversion to Diesel propulsion.

Class E. 175 steel vessels. Vessels not considered suitable for American-flag operation.

Class F. 40 vessels. Obsolete types and too old to be rejuvenated or too badly damaged to be serviceable.

SPECIAL TYPE

Army Transports—5. Considered competitive units and in good condition.

Passenger vessels—33. Including 535's, 500's and ex-enemy vessels, 30 of which are in spot condition with 3 laid up and being considered for reconditioning.

Tugs—35. Steel ocean-going, coal and oil burners; wood ocean-going, oil burners and harbor tugs. 6 in operation—9 laid up but in fair physical condition.

In addition to the above there are 362 ships in operation. These vessels have not been individually surveyed, as they are in good operative condition.

Bids Open Nov. 5 at Nashville for 90-Foot Snagboat

SEALED proposals will be received until November 5, by the United States Engineer Office, Nashville, Tenn., for one steel snagboat hull. The boat is to have a length molded of 90 feet, breadth molded 25 feet, depth molded at sides 3 feet 6 inches. The "A" frame will be about 30 feet long and there is to be one upright hand capstan of approved make, having a barrel 9½ inches in diameter over whelps.

The boat is to be delivered afloat at Fox Bluff, Tenn.

Shipping Board Turns Money Into Treasury

Chairman Farley of the United States Shipping Board has made public a letter to the Secretary of the Treasury showing that the Emergency Fleet Corporation had transferred to the general fund of the Treasury over $37,000,000 as the result of liquidation of the board's war-time activities.

The above amount, together with $61,808,729.48 deposited to the credit of the "Construction Loan Fund" as directed by Congress, makes a grand total of $99,435,312.71, which has been deposited in the Treasury during the past two years.

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City of Philadelphia to Vote on Issue of $8,923,000 for Carrying on Extensive Port Expansion Plan

ON November 6, 1923, the city of Philadelphia will vote on a loan, the marine content of which provides for a total of $8,923,000 worth of port work. It is also understood that provisions are being made for the construction of six mud scows, at an estimated total cost of $120,000, the pier and boat work to be carried on by the Department of Wharves, Docks and Ferries, of which George F. Sproule is the Director. Among the items of port work are the following:

Toward the acquisition of real estate for the approaches to and erection and construction of the approaches and superstructure of the Delaware River bridge, $5,623,000; toward the acquisition of real estate and real estate easements, and for the erection, construction, improvement and equipment of wharves, docks, bulkheads and the work appurtenant and adjacent thereto, $2,000,000; toward the cost of acquiring land for approaches to and the erection and construction of approaches and superstructure of the Delaware River bridge, $800,000; for the erection and construction of bridges, $500,000.

Funds will also probably be used toward the completion of Piers 82 and 84 South, foot of Wolf and Porter streets, Delaware River.

Twenty Steel Barges and Two Double Dipper Dredges Proposed by Engineer Office, Louisville, Ky.

THE construction of twenty steel barges, at an estimated cost of approximately $300,000, is planned by the United States Engineer Office, P. O. Box 72, Louisville, Ky. Plans and specifications are now being completed.

It is understood that two of the boats (Lot A) will have a length of 120 feet, beam 36 feet, depth 7 feet 6 inches; two (Lot B) will have a length of 100 feet, beam 25 feet and depth 5 feet; and sixteen (Lot C) are to have a length of 110 feet, beam 26 feet, depth 6 feet 6 inches. Fourteen of the boats under Lot C are to be constructed with cargo boxes.

TWO STEEL DREDGES

The same office expects to ask, in the near future, for bids for furnishing and delivering machinery and plans for two steel dredges. A complete description of the dredge machinery and plans, including dimension of machinery, size and boilers, gear, etc., together with drawings to show the layout, method of operation, and the hull of the proposed dredges, will be asked for.

The dredges are to be steam operated, equipped with a Scotch marine type boiler with water back and designed for a working pressure of at least 125 pounds. The vessels are to be capable of dredging compacted gravel, the machinery to be designed for a 4-yard dipper in hard gravel and a 2½-yard dipper in rock. Each dredge will be equipped with two dippers, one for rock and one for sand and gravel.

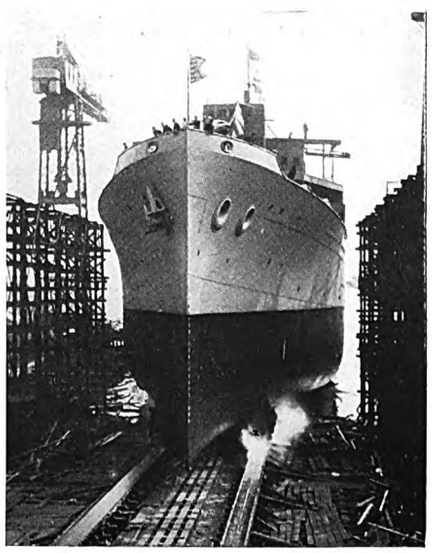
The dredges should draw not over 4 feet, when completely outfitted and loaded with 30 tons of coal.

Towboat and Barges Planned by Western Barge Line

It is reported from Omaha, Nebraska, that the Western Barge Line, a newly organized company of that city, plans the construction of one towboat and four to six barges to operate on the Missouri River. The tug is to have an overall length of about 108 feet, beam 24 feet, depth 3½ feet, and is to have a 15-foot stern wheel. The barges will have a draft of 6 inches light and 30 inches loaded.

Gas Manufacturers to Co-operate with Welding Schools

The Gas Products Association, 140 S. Dearborn street, Chicago, Ill., recently appointed an educational committee to cooperate with trade and technical schools all over the country in supplying a practical and standard course in welding procedure. The committee will endeavor to build up a list of accredited schools which are known to give a standard instruction, and whose students can be depended upon to qualify as satisfactory welding operators. It is proposed to make this educational movement effective all over the country.



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Launching the Fuel Ship Whitney at the Boston Navy Yard. The Vessel Will Cost About $8,000,000

World's Shipbuilding Reaches Low Level

WORLD construction at the close of quarter just ended was smaller than at any time since the close of the war, Lloyd's Register states, and this represents a decline of more than 165,000 gross tons in comparison with the preceding quarter, ending June 30, last. In the past three months the aggregate of American construction decreased 34,000 tons, that for Great Britain and Ireland, 66,000 tons, and for all other countries combined 65,000 tons.

The following table shows in gross tons the comparison of construction orders now, as compared with three months ago:

	October 1	July 1
Great Britain and Ireland.	1,271,195	1,337,759
United States.....	99,383	133,660
Other countries.....	1,007,119	1,072,437
World total.....	2,377,697	2,543,856

If only construction on which work is actually proceeding is taken into consideration, however, Lloyd's Register points out, the present aggregate is 229,000 tons less than three months ago. Contracts on which work has been suspended in Great Britain and Ireland now represent 242,000 tons, as against 83,000 tons for all other countries. The actual construction now under way, therefore, compares with that of the previous quarter as follows, the figures representing gross tons:

	October 1	July 1
Great Britain and Ireland.	1,029,195	1,207,759
Other countries.....	1,023,502	1,074,097
World total.....	2,052,697	2,281,856

It will be seen, therefore, says Lloyd's Register, that while the actual work in British shipyards has decreased more than 175,000 tons since July 1, that in all other countries taken together has fallen off only 50,000 tons. As a result, British plants, which three months ago were constructing 133,000 tons more than all the rest of the world combined, are now building only about 5,000 tons more.

Idle French Shipping Decreases

A STEADY decline in the number of idle French ships reported in the first half of 1923 is reported by the *Journal de la Marine Marchande* of August 16, forwarded the Department of Commerce by Commercial Attache C. L. Jones. Idle French tonnage as of January 15, April 15, and July 15, 1923, is shown in the following table:

Date	Number	Tonnage	Percent of total
Jan. 15.....	530	845,255	23
April 15.....	450	796,247	21
July 15.....	409	561,382	18

The figures for July 15, compared with those of April 15, show a decrease of 14 percent in the number of idle ships and of 17 percent in idle tonnage. The total idle tonnage on July 15 constituted 18 percent of all the French merchant marine.

Cannery Buys Shipyard

Word comes from Seattle that the wooden shipbuilding plant at Houghton Lake, Washington, originally known as the Anderson Yard, has been purchased by the Alaska Consolidated Canneries from the Lake Union Drydock and Machine Works. The new owners will continue the yard in commercial business.

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First American-Built Doxford Diesel Proves Its Value in the Miller County

THE *Miller County*, an 11,000-ton deadweight oil tanker owned by the Sun Shipbuilding Company, one of three sister ships equipped with engines of the Doxford two-cycle, four-cylinder opposed piston type built by the Sun yard, arrived in New York Harbor September 27 after a practically perfect run from Tampico with a cargo of Mexican crude oil for the Warner-Quinlan Company at Carteret, N. J. The Doxford engine in this ship is the first to be built in this country and has proven satisfactory in every way for the entire 15,000 miles which the ship has made since she was changed from a turbine drive.

VESSEL BOUGHT FROM SHIPPING BOARD

The hulls for the three ships, the *Miller County, Bidwell* and *Challenger,* were bought from the United States Shipping Board and converted by the Sun Shipbuilding Company plant, Chester, Pa. The *Miller County* is about 460 feet overall length, 60 feet beam and 27½ feet draft with a deadweight of 11,000 tons at this draft. Her main engine is of 3,000 indicated horsepower driving a single screw. One Scotch boiler was retained from the former installation to supply the auxiliaries which are all steam operated, as well as for the tank heating coils. The engine complete, including the thrust shaft and fly wheel, weighs approximately 370 tons.

PERFORMANCE OF THE ENGINE

On her voyage from Tampico the engine developed 2,820 indicated horsepower at 71.1 revolutions per minute with a fuel consumption of 0.344 pound of oil per indicated horsepower per hour. Each cylinder developed exactly 705 indicated horsepower for the trip, the exhaust temperature averaged 630 degrees F. With a fuel pressure of 8,000 pounds, her average speed was about 11 knots. On the 2,030 miles run the total fuel consumption was 72 barrels of Texas crude oil. With Diesel oil of 23 degrees Beaumé better fuel economy is expected.

The performance of the Diesel engine in this ship is strikingly brought out by the fact that the single boiler supplying the auxiliaries consumed nearly as much fuel during the voyage as the main engine.

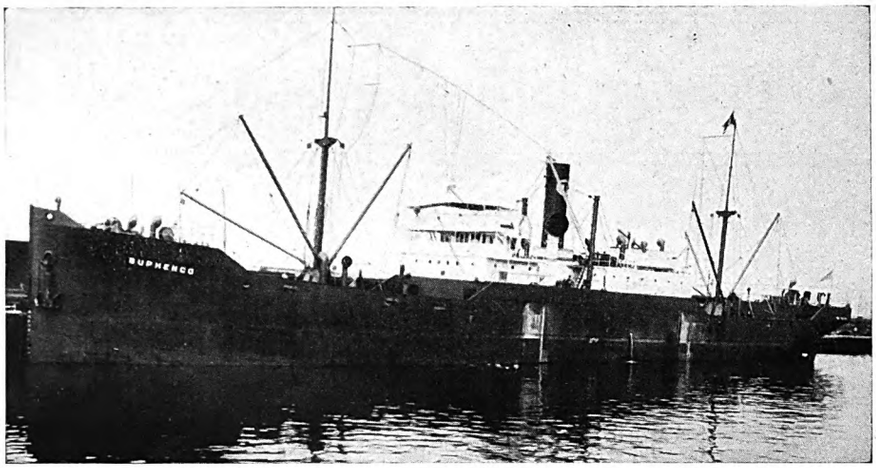
The second ship to be equipped with a Sun-built Doxford engine has steam driven auxiliaries also, but the *Challenger,* the third of the class, will be fitted with electric-driven auxiliaries throughout.

Navigation School Reopened at Seattle

According to announcement from Seattle, Wash., the University of Washington has announced that as a part of its extension service program it will reopen the Navigation School at the University Observatory. The school was conducted during the war by the United States Shipping Board, but its activities were discontinued two years ago when the Shipping Board withdrew from the enterprise because of lack of funds.

Shipping Board Awards Fuel Oil Contract

As the result of competitive bids opened October 1 for furnishing 1,065,000 barrels of fuel oil to the Shipping Board per month for the calendar year 1924, the contract has been awarded to the Standard Oil Company of New Jersey.



Motorship Suphenco, of 5,350 Tons Deadweight Capacity, Operated by the Transmarine Lines

Car Ferry George H. Walker Goes Into Service

THE Gulf Coast Lines have put in service at Baton Rouge, La., a new transfer steamer, the *George H. Walker,* to ferry its trains across the Mississippi river.

The new boat is of steel, 340 feet long, 91 feet 6 inches wide with a molded depth of 11 feet. It was built by the Dravo Contracting Company, Pittsburgh, Pa., and cost over $250,000. It has three tracks and can carry 12 passenger cars or 21 freight cars.

The boat is propelled by independently operated side wheels driven by two engines each developing about 600 horsepower from boilers carrying 200 pounds steam pressure.

New Hudson River Day Line Boat Launched

The excursion steamer *Alexander Hamilton* built by Bethlehem Ship Building Company at Sparrows Point for the Hudson River Day Line, was launched October 20. The completed vessel will cost $1,000,000.

The new boat is 348 feet in length, 77 feet beam and 13 feet deep. She has a capacity of 4,000 persons.

The vessel will be equipped with four Scotch oil-burner boilers, and she will be capable of making slightly over twenty-one knots.

Steel Tug Contract Goes to Howard Shipyards

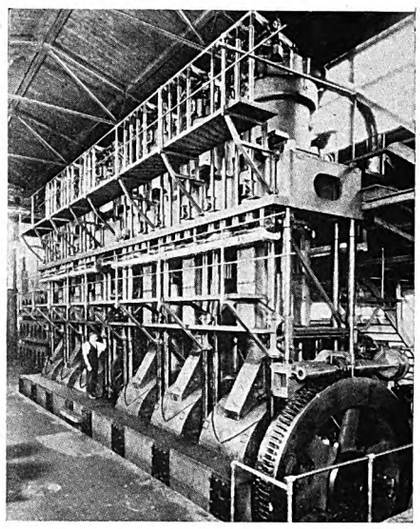
The American Steel & Wire Company has awarded a contract for a $150,000 steel towboat to the Howard Shipyards, Jeffersonville, Ind. The boat is to have a length of 165 feet, 32 feet beam and 6 feet draft. She will be equipped with compound condensing engines, having a 7-foot stroke.

New Dry Dock in Tampico

One of the important building propositions now being developed in Mexico is the dry dock in Tampico which will be the largest on the east side of America from Galveston to Panama. This dry dock will be built at Buckley Island on the Panuco River and as a part of the project shops and shipyards will be erected.

Transmarine Motorship Completes Maiden Voyage

WITH the arrival of the M. S. *Suphenco* at Port Newark, N. J., on October 9, the first Transmarine motorship, completed its maiden voyage to the Gulf cities of Pensacola and Port Arthur and return. This voyage, totaling over 5,000 nautical miles, afforded ample opportunity



The Suphenco's 1,800 Horsepower Diesel Engine

to show the merits of the vessel's Diesel engine. Averaging a little better than 10 knots, the *Suphenco* consumed 4½ tons of fuel oil a day. The fuel oil carried by the *Suphenco* permits a cruising radius of 38,000 miles.

The engine is a 6-cylinder, 4-cycle cross head Craig-Diesel having a 30-inch bore and 4-foot stroke, operating at a maximum of 100 revolutions per minute. The main bearings, crank shaft and piston are water cooled.

One of the features of the engine is the elimination of the customary air compressor attached to the main crank shaft. The fuel air is injected by compressor as usual but this is supplied by an auxiliary unit. All deck machinery, winches, windlass, steering gear together with engine room pumps and auxiliaries are operated by electricity with specially designed marine Elco motors.

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Foreign Shipping and Shipbuilding Activities

Italian Line Orders Three Steamers

THE Societa in Azioni Navigazione Libera-Trientina, of Trieste, has placed an order with a local shipyard for three steamers. The company already owns twenty-eight vessels, all engaged in the ocean tramp trade and ranging from the *Rosandra* (7,756 tons gross) to the motorship *Sesta* of 107 tons gross. It is understood that the new vessels will be of the *Laguna* (5,400 tons gross) type.

Canadian Yards Inactive

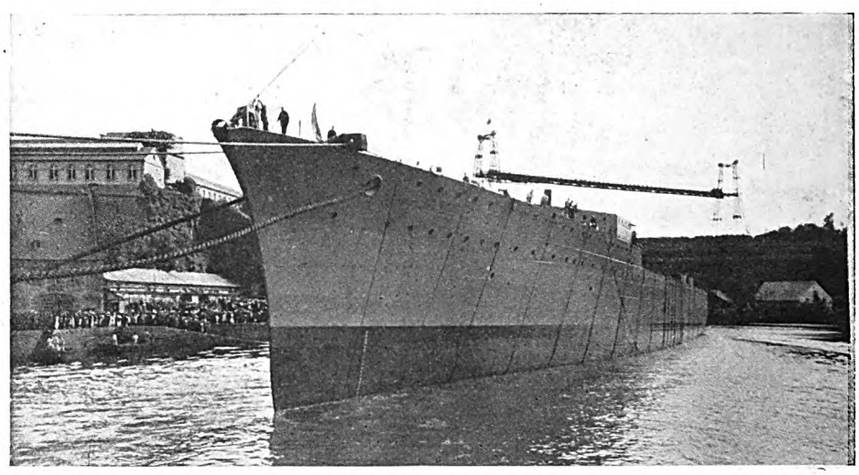
ADVICES from Ottawa state that business is dull in Canadian shipping and shipbuilding circles. On July 31 there were 132 more vessels of all kinds on the Canadian register than there were at the end of 1922, still the net tonnage was about 69,000 tons less. Quite a few boats are being built, but these are being offset by removals, the latter being so well looked after that there is now but little, if any, deadwood on the register.

Montrose Yard to Build Passenger Steamer

AN order has just been placed with the Coaster Construction Company, Ltd., Montrose, for a passenger day service steamer for the Union Steamship Company of British Columbia. This will be easily the largest vessel ever built in Montrose, as she is to be 236 feet over all and 40 feet in breadth. The steamer will be handsomely fitted up with a large dining saloon capable of being used as a dancing saloon, a large lounge, staterooms, smoking room, etc. Space will be reserved forward for the carriage of a certain amount of general cargo. The vessel will be completed early next year.

Steamship Voltaire Completed

The new Lamport & Holt liner *Voltaire*, built for service between New York and South America, will leave Liverpool on her trial trip November 15.



Launching of the 8,000-Ton French Cruiser Duguay-Trouin at Brest Dockyards on August 14. Her Engines Will Develop 110,000 Horsepower

Wreck of Fourth French Steamer Starts Investigation—Naval Building Program

By Our Paris Correspondent

THE principal event in connection with French shipping which has taken place in the last month is the wreck of the cargo steamer *Depute-Emile-Driant*, belonging to the steamship company Les Armateurs Français, which capsized on August 30 when she was proceeding from Newcastle-on-Tyne to Rouen with an important cargo of coal. That vessel belonged to the series of the *Marie-Louise*, also known in this country under the name of the series of the *Deputes*, three of which have already been wrecked within two years.

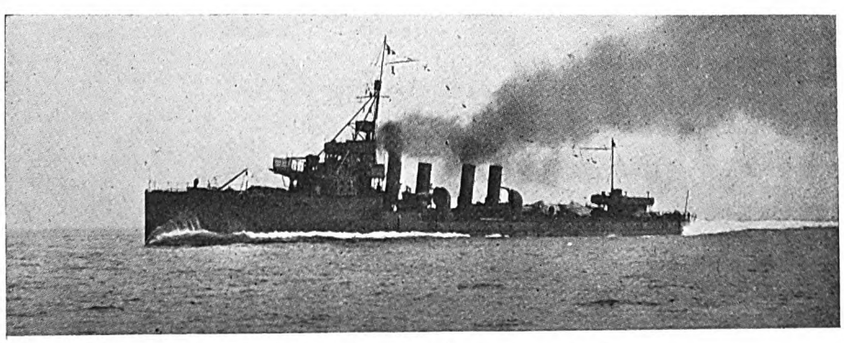
The vessels of that type belonged to the State merchant fleet which was liquidated in 1922: the first vessel of the series, the *Marie-Louise*, which was owned by a private firm, was taken as a model by the Department of Merchant Marine when the Government decided during the war to build merchant ships. The vessels were built by naval dockyards under the supervision of naval architects of the Admiralty. It is pointed out that various alterations in the original design were brought about by the latter, and it is hinted that any imperfections in the ships might have been caused by those alterations.

Experts Investigate Seaworthiness of the Vessels

The three other vessels of the series which have been wrecked are the *Depute-Raoul-Briquet*, the *Depute-Gaston-Dumesnil* and the *Depute-Albert-Taillandier*. Following the wrecks of these three vessels, the Under Secretary of State for Mercantile Marine appointed in 1922 a committee of experts with a view to making a careful examination on the seaworthiness of the vessels of that type. The experts stated that the seaworthiness of these ships was reliable provided that some alterations were made in order to minimize the chances of the recurrence of such disasters.

The chief feature of the construction of these ships lies in the existence of lateral tanks situated in the upper part of the hull. The committee recommended that henceforth these tanks should not be filled. Apart from that particularity, it is now ascertained that these vessels have an abnormal aptitude to rolling and that the exaggerated rolling in a rough sea involves a considerable displacement of the cargo in the holds which results in the capsizing of the ships.

The four vessels were wrecked under similar conditions, without any professional fault having been committed by the shipmaster, and it is now certain that an imperfection in the construction which has still to be ascertained has been the cause of the four



French Destroyer Ensigne Gabolde

On her official six-hour trial this vessel, built by Chantiers & Ateliers Augustin Normand at Havre, made an average speed of 33.45 knots or 2.5 knots more than her contract speed.

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successive wrecks which entailed the loss of 45 lives. The Under Secretary of State for Mercantile Marine has just appointed a new committee of experts who have been entrusted with the task of settling definitely the question of the seaworthiness of the vessels.

CRITICISM AROUSED

The keenest emotion has been felt in the whole country as a result of the new disaster, and there is much speculation in respect to the conclusions of the experts. It is noteworthy that eleven vessels of the same type are still in service in this country. Many papers have echoed the general feeling and the criticism expressed against the Under Secretary of State for Mercantile Marine, and the naval architects who drew up the plans of the ships, and they have requested that the eleven ships still in service be at once laid up in order to avoid the recurrence of such disasters, pending the decisions to be arived at by the experts.

The principal dimensions of the vessels of the *Marie-Louise* type are: Length, 266 feet 8 inches; breadth, 39 feet 4 inches; depth, 22 feet 11 inches; gross tonnage, 2,310 tons.

NAVAL SHIPBUILDING PROGRAM

Considerable interest has been aroused in connection with the launching of the new cruiser *Duguay Trouin,* which took place at Brest on August 14 last. *This is the first cruiser launched in France since the war.* The *Duguay Trouin* belongs to the naval building program which was ratified by Parliament in 1921. Two other cruisers are under construction, also in naval dockyards: these are the *Primauguet* and the *Lamotte-Picquet.* The three cruisers are to be completed in 1925.

Private shipyards are also concerned in the construction of these warships, and it is noteworthy that the orders placed by the Department of Navy have much improved the position of some shipbuilders. The propelling machinery of the three cruisers is to be supplied by three private shipyards (Chantiers de Saint-Nazaire-Penhoet, Chantiers de la Loire and Forges et Chantiers de la Mediterranee). It will consist of turbines of the Parsons type developing a total of 110,000 horsepower. The cruisers, which will be quadruple-screw ships, are to maintain a service speed of 33 knots.

In addition to these three cruisers, the Department of Navy placed some months ago important orders with private firms in connection with the construction of 4 destroyers, 12 torpedo-boats and 12 submarines. All these warships are to be delivered in 1925.

CONVERSION OF THE FRANCE TO AN OIL BURNER

The French Line is making preliminary arrangements for the conversion of the liner *France* to an oil burner which is to be completed at Saint-Nazaire by the Chantiers et Ateliers de Saint-Nazaire-Penhoet on May 4, 1924. A general overhaul of the boilers of the liner will be carried out together with the transformation work. One hundred and twelve new combustion chambers which have been supplied by the Chantiers de la Seine Maritime are to replace the old ones.

For the execution of this work, the total cost of which will exceed 10 million francs, the Chantiers de Saint-Nazaire-Penhoet have requested the assistance of several other shipyards of Saint-Nazaire. The oil burning plant is to be supplied by the Wallsend Slipway Engineering Company on the Wallsend-Howden system which has already been installed on the *Paris* and several other ships of the French Line, as well as on most of the French oil burners.

Following her reconditioning, the *France* will be capable of maintaining a service speed of 21.5 knots. She will sail from Havre on her first voyage as an oil burner on May 10. It will be remembered that the *France* was built in 1912 by the Chantiers de Saint-Nazaire-Penhoet. She is 689 feet 2 inches long, 75 feet 6 inches beam and 48 feet 5 inches deep; her displacement (loaded) is 27,192 tons, her gross tonnage 23,666 tons. The propelling machinery consists of 4 steam turbines each driving one propeller shaft. The total power developed is 42,000 horsepower. Steam is supplied by 19 boilers.

Two Large Steamers for Canadian Pacific Coastwise Fleet Planned

E. W. Beatty, K.C., president of the Canadian Pacific Railway, recently addressed a meeting of the Vancouver board of trade and announced that his company proposes to add two large modern steamers to its coast fleet, immediately, to take care of increasing tourist traffic. He also announced the early completion of a new pier at the harbor to cost several millions of dollars.

TRADE PUBLICATIONS

BUYING RUST PROTECTION.—The Eagle-Picher Lead Company, Chicago, Ill., has prepared a booklet on selecting a rust-proof paint and the features which determine its economy. Data on this subject is of valuable assistance in the selection of efficient, labor-saving economical paint for metal protective surfaces. In addition to taking up the cost of painting new surfaces, it also gives information on the preparation and re-painting of surfaces with sublimed blue lead.

WELDING CABLE.—Two announcements by the Rome Wire Company, Rome, N. Y., have been published describing special extra flexible electric welding cable and special-service cord. Many applications of these two types of cord, the first for welding outfits and the second for a variety of shop and household uses, are outlined.

SWITCHBOARD INSTRUMENTS.—Bulletin No. 450 of the Roller-Smith Company, 233 Broadway, New York, deals with alternating current switchboard instruments, including ammeters, voltmeters, single phase and polyphase wattmeters, frequency meters, power factor meters, synchroscopes, ground detectors, transformers, etc. Illustrations and specifications of each instrument are given together with a price list.

INDICATING AND RECORDING CO_2 METERS.—The Brown Instrument Company, Philadelphia, Pa., has sent out catalogue No. 30 describing electrical meters for the measurement of CO_2 content and temperature of flue gases. The efficient combustion of fuel requires an accurate knowledge of the combustion products. The meters designed by the Brown Instrument Company, it is stated, have been found satisfactory in meeting the demands of industrial operation. The principles of operation and maintenance of this equipment are included in the catalogue.

POLYPHASE INDUCTION MOTORS.—Motors of rugged construction and reliable in operation to meet severe requirements of land and sea service have been developed by the Burke Electric Company, Erie, Pa., and details of these polyphase induction motors are given in a bulletin recently sent out by the company. It is stated that these motors have been applied in practically every industry in which electric drive has been adopted and are arranged for side wall or ceiling suspension and furnished with vertical or back gears to meet special requirements.

MECHANICAL OIL BURNING SYSTEMS.—The low pressure mechanical oil burning system, known as the Scarab-Coen has been described in a catalogue prepared by the Scarab Oil Burning Company, Ltd., Carlton House, Regent Street, London, England. This system has been fitted to over 1,000 installations of which the marine section exceeds a tonnage of over four and a half million ships. The company recommends this booklet to those interested in the question of economic steam production.

ELECTRIC RADIATORS.—The electro-vapour radiators put on the market by Walter Kidde and Company, New York city, are explained in a booklet now being distributed. This radiator gives by the turn of a switch the same heat electrically as the usual steam or hot water radiator and can be adapted to any installation where the usual cast iron radiator is installed.

FLOOR AND BENCH GRINDERS.—The two-wheel floor and bench grinders, manufactured by the Hisey-Wolf Machine Company, Cincinnati, O., are illustrated and described in detail in a new bulletin prepared by the company. Floor stand grinders are made in seven sizes ranging from ½ to 10 horsepower capacity, while the bench grinders are in two sizes of ½ and 1 horsepower capacity. The special features of these grinders are outlined with specifications and other details.

DIESEL YACHTS.—Cox & Stevens, New York city, has sent out a pamphlet which was recently prepared on the use of Diesel engines in yachts. The effect that this type of engine has on yacht design is fully discussed. This firm has designed a number of highly successful Diesel yachts, some of which have been built in this country and others abroad. A number of special type yachts are described in more or less detail and illustrations given of the completed designs. The book contains valuable information on the subject of Diesel engines in general and some interesting comparisons between what can be accomplished in cruising yachts powered with Diesel engines and those fitted with other types of machinery in connection with accommodations, cruising radius and cost of operation.

WELDING AND CUTTING EQUIPMENT.—The Torchweld Equipment Company, Chicago, Ill., has issued a new catalogue covering its complete line of oxy-acetylene welding and cutting apparatus, lead welding, soldering, brazing, decarbonizing units, gas pressure regulators, automatic machines, generators and supplies. The catalogue contains cross sectional views of equipment with detailed explanations.

Business Note

Walter Kidde & Company, Inc., 140 Cedar street, New York, announce that the Lux System is now exclusively manufactured and sold by them in the United States of America. With the Lux System a container storing fifty pounds of carbon dioxide under pressure can be released in forty seconds depositing carbon dioxide "snow" at a temperature of less than —100 degrees F. upon the fire thereby cooling the charred mass in addition to extinguishing the fire by smothering it. The Lux System may be combined with the Rich System of smoke detection, using the same piping, thereby affording a fire detecting and extinguishing equipment for closed compartments.

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Marine Construction News of the Month

Ship Contracts — New Ship Concerns and Shipyard Improvements—Terminal Projects—Government Contracts

SHIPBUILDING AND REPAIRS

Repairs, Philadelphia, Pa.—The steamship G. A. Flagg is undergoing repairs at Cramp's shipyard.

Engine Repairs, Seattle, Wash.—Repairs were made on the engine of the steamship Queen recently.

Wood Steamer Repairs, Norfolk, Va.—The wooden steamer Mendora has been towed from Baltimore to Norfolk for repairs.

Spudding Engines, Nashville, Tenn.—U. S. Engineer Office, Customhouse, Nashville, Tenn., is in the market for two spudding engines.

British Steamer Repairs, Seattle, Wash.—As a result of grounding the British steamer Sunland has been drydocked at Seattle, Wash.

Repairs, San Francisco, Cal.—Smith & Scanlon were low bidders at the opening of tenders, recently, for repairs on the Pacific Mail liner Newport.

Steamer Drydocked, Portland, Ore.—The steamer Astorian, one of the river fleet which has been sold to be taken to Puget Sound, has been drydocked for repairs.

Steamer Painting, etc., Portland, Ore.—The steamer West Keats, of the Columbia-Pacific Shipping Company, has been drydocked for cleaning and painting.

Docking and Repairs, Baltimore, Md.—The United States Coast Guard cutter Comanche has been taken to the yard of the Maryland Drydock Company for docking and repairs.

Complete Overhauling, Savannah, Ga.—The Savannah liner City of Montgomery has been taken to the wharf of Rourke's Iron Works for extensive repairs and overhauling.

Pump Repairs, Jacksonville, Fla.—The steamer Allagunsh, of the Foreign Transport & Mercantile Line, has been taken to Jacksonville for repairs to her circulation pump.

Cleaning and Painting, Portland, Ore. — The schooner North Bend has been lifted on drydock at Portland for cleaning and painting. The Oregon Pine is also on the drydock.

Propeller Installation, San Francisco, Cal.—The new Electra Line steamer Cuba went to the Bethlehem Shipbuilding Corporation's yard for the installation of a new propeller blade.

Conversion Work, Whitehaven, Md.—After having been a Chesapeake Bay freighter for 51 years, the schooner Eugie has been taken to the Whitehaven shipyard, Maryland, to be rebuilt.

Tanker Drydocked, Chester, Pa.—The Atlantic Refining Company's tanker Frances E. Powell has been drydocked at the Sun Shipbuilding and Drydock Company's yard, Chester, for miscellaneous repairs.

Completion of Repairs, Los Angeles, Cal.—The Los Angeles Shipyard has completed repairs on the Shipping Board tanker Hoven, chartered to Walker & Daly, the damage cost being approximately $30,000.

Vessel Repairs, Los Angeles, Cal.—The tank steamer Hampton Roads, operated by Struthers & Barry, has been placed on the ways of the Los Angeles shipyard for repairs due to recent collision.

Bid Openings, San Francisco, Cal.—Bids have been taken for repairs and other work to the Pacific Mail steamers San Juan and Ecuador, and also for repairs to the French liner Montana, recently damaged in collision.

Spud Gallows Bids, Jacksonville, Fla.—The W. G. Brennan Company, Jacksonville, Fla., was low bidder at $1,200 for a spud gallows frame for the dredge Mallory, of the U. S. Engineer Office, Jacksonville, Fla.

Low Bidder, San Francisco, Cal.—The Bethlehem Shipbuilding Corporation was low bidder for covering miscellaneous repairs on the Panama steamer Ida of W. L. Comyn & Company, at recent bid openings.

Flat Boats Proposed, Cincinnati, O.—The United States Engineer Office, Cincinnati, Ohio, has under consideration the construction of three steel needle flat boats for use on the Ohio River dams. The cost will be about $2,000 each.

Cargo Carrier Reconditioning, San Francisco, Cal.—The General Engineering Corporation of San Francisco has received the contract for the reconditioning of the Shipping Board cargo carrier Liberty Land, at a price of $14,110.

Contract Awarded, Tacoma, Wash.—The Todd Dry Dock & Construction Company, Tacoma, Washington, has been awarded a contract for six steel barges for the U. S. Engineer Office, at Portland, Ore. It is understood that the total price is $114,900.

Survey, etc., Quincy, Mass.—The steamer Mars, which recently grounded while leaving Boston on a trip to Norfolk, has been to the Fore River Shipbuilding Company's plant in Quincy for survey and repairs. It was found that some plates were damaged.

Fifteen-Barge Job.—The West Kentucky Coal Company of Sturgis, Ky., has awarded the contract for lumber for fifteen new wooden barges to the Marsh & Truman Lumber Company, Chicago. The Coal Company will build the barges at its plant at Paducah, Ky.

Boats Under Construction, Fort Myers, Fla.—A speed-pleasure boat, under construction at the Williams ways in East Fort Myers, and a concrete boathouse, being built by Contractor D. W. Ireland, west of Fort Myers, are being constructed for Med D. Kelum, of Fort Myers.

Shipyard Activities, San Francisco, Cal.—The Bethlehem Shipbuilding Corporation has been awarded the work of installing a new fore-foot on the Standard Oil tanker Richmond, and also general repairs for damage sustained by fire on the American-Hawaiian fleet freighter American.

Steamers Reconditioned, New York, N. Y.—According to recent announcement, the American liner Manchuria and the Red Star liners Kroonland and Finland will be reconditioned in New York for the new service of the International Mercantile Marine Company to Pacific Coast ports.

Voyage Repairs, San Francisco, Cal.—The following were the bids received for voyage repairs to the Pacific Mail liner President Pierce: United Engineering Company, $5,179; Bethlehem Shipbuilding Corporation, $5,597; General Engineering and Drydock Company, $6,149, and the Moore Drydock Company, $6,695.

Small Craft for U. S. Engineers.—The United States Engineer Office, New Orleans, La., has awarded the contract for furnishing and delivering one inspection boat, complete, to Duvic Sons, at a price of $2,963. It is reported from Wilmington, N. C., that the Engineer Office proposes to purchase one motor dredge tender.

Navy Cruiser Launched, Philadelphia, Pa.—The Marblehead, the fourth of five light cruisers built or now building at the yards of the Wm. Cramp & Sons Ship and Engine Building Company for the United States Navy, was launched from the ways of the company on Tuesday, the results of which proved satisfactory in every way.

Reconditioning Bids.—The General Engineering and Drydock Company, San Francisco, Cal., was low bidder for reconditioning the Shipping Board steamer Liberty Land for spot service, when tenders were received, recently. The following were the proposals: General Engineering, $14,110; Moore Drydock Co., $24,227; Bethlehem Ship. Co., $24,814.

Low Bidder, Tanker Repairs.—The Crowley Shipyard, San Francisco, Cal., was low bidder at the opening of tenders for extensive general repairs to the Shipping Board tanker Betterton. The prices were: Crowley Shipyard, $4,200; General Engineering, $7,490; Bethlehem Corp., $7,680; Moore Drydock Co., $7,797; United Engineering, $8,150.

Bids for Repairs, West Coast.—At the opening of bids, recently for reconditioning the United States Shipping Board steamer West Montop for spot service, the Hanlon Shipyards, of Oakland, Cal., submitted the lowest tender. The following prices were submitted: Hanlon, $15,620; General Engineering, $17,252; Bethlehem, $17,467; Moore Drydock Co., $19,935.

Contract Awarded, San Francisco, Cal.—The contract for general repair work on the Shipping Board steamer West Prospect has been awarded to the Crowley Shipbuilding Company. The bids on the vessel were as follows: Crowley Shipyard, $1,660; Main Iron Works, $1,709; Theodore Smith, $1,882; Bethlehem Shipbuilding Corporation, $1,993; General Engineering Company, $2,095.

Conversion Job, Brooklyn, N. Y.—The contract for converting the 3-masted commercial schooner Priscilla Alden into a motor yacht has been awarded by the firm of Tams and King to the Tebo Yacht & Basin Company, of the Todd Shipyards Corporation. The vessel is to be equipped with Frisco Standard engines and it is understood the contract will cost close to $70,000.

Bids for Boiler and Fittings.—The Charleston Dry Dock & Machine Company, of Charleston, S. C., with a price of $8,764, was low bidder for furnishing one steam boiler, with fixtures, stack, etc., for the U. S. dredge Upatoi, at the recent opening of proposals by the U. S. Engineer Office, Mobile, Ala. Two bids were submitted, the other being a price of $13,820 by the Federal Shipbuilding Company, both tenders having been rejected.

Tug Launching, Los Angeles, Cal.—The new tug D. M. Renton, a sister-ship of the recently completed David P. Fleming, has been launched on the west coast. The vessel is 85 feet long, has a 250-horsepower Winton Diesel engine, and cost $75,000. She will have a speed of 12 knots. The tug is being built by the William Muller shipyards, which has orders for three more such tugs for the Wilmington Transportation Company.

Shipyard Activities, West Coast.—The steamer Floridian has been placed on the drydock at the Bethlehem Shipbuilding Corporation's plant, San Francisco, for an overhauling and repainting. The Union Line motorship Huraki has gone on the drydock of the same company for propeller repairs. The freighter Steel Seafarer has been at the Moore yard, Oakland, for the replacing of three plates on the port side of the vessel.

Propeller Wheels, Philadelphia, Pa.—According to recent announcement a new set of propeller blades have been ordered from the William Cramp & Son Shipyards, at Philadelphia, for the United States Line steamship George Washington. The new wheels for the George Washington will be 21 feet 3 inches in diameter (the steamer now making a speed of 18½ knots), while those of the Leviathan, also cast by the Cramp Company, are 16 feet 6 inches.

Contract for Derrick Boat Hulls Awarded.—The Chief of Engineers, Washington, D. C., has awarded to the Dravo Contracting Company, Pittsburgh, Pa., a contract for nine steel derrick boat hulls, at a total price of $130,140, delivery to be in 270 days. Six of these hulls are for the Louisville district of the Ohio River, two are for the Engineer Office at Rock Island, Ill., and the ninth is for use on the Green River, Ky.

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Tanker Launched, San Francisco, Cal.—The Alaska Standard, building for the Standard Oil Company for use in Alaska waters, was recently launched from the ways of the Bethlehem Shipbuilding Corporation. The vessel is 210 feet in length, 40 feet beam and 16.6 feet deep. She will be equipped with two 400 horsepower Diesel engines, have a speed of about 12 knots and a carrying capacity of 12,000 barrels.

Diesel Installation on Admiral Line Ships.—The Admiral Line has called for bids on the transfer of Diesel engines from the wooden motorship Benowa to the steel auxiliary schooner Moonlite. Upon the installation of the engine the Moonlite will be placed in the constwise trade. It has been stated that the conversion of the Moonlite is the first step to re-engine four ships of the same class with engines from four vessels of the Benowa type.

Contract for Dredge Awarded, Louisville, Ky.—The E. T. Slider Company, Fulton and Campbell streets, Louisville, Ky., has awarded the contract for a steel dredge boat hull and cabin to the Midland Barge Company, of Pittsburgh, Pa. The hull is to have a length of 176 feet, beam 50 feet, and depth 6 feet. The same company, which deals in sand and gravel, has awarded a contract for six heavy type steel barges to the Howard Shipyards, Jeffersonville, Ind.

Repairs, San Francisco.—The General Engineering and Dry Dock Company was low bidder on two reconditioning jobs, at recent tender openings. The work of reconditioning the West Mingo for spot service showed a bid of $21,540 from the General Engineering Company, the other prices submitted being: Moore Drydock Company, $23,644.55, and Bethlehem Shipbuilding Corporation, $24,430. The company bid $4,294 for general repairs on the Government vessel, General Frank M. Coxe, and they were awarded the contract.

Vessel Repairs, West Coast.—At the opening of tenders for the carrying out of repairs to collision damage on the French Line steamer Montana, the Moore Drydock Company was low bidder. The work consists of repairs to her bow, covering the renewal of five plates, four plates to be faired up, fifteen new frames to be installed and new anchor stocks. The bids were as follows: Moore Drydock Company, $22,495, 14 days; Bethlehem Shipbuilding Corp., $25,960, 13 days; United Engineering Works, $26,450, 16 days; General Engineering Co., $27,000, 18 days.

Vessel Repairs, Brooklyn, N. Y.—The Robins Drydock & Repair Company, of the Todd Shipyards Corporation, Brooklyn, N. Y., was awarded the contract for repairing collision damage to the steamship West Arrow, at the opening of bids by the Shipping Board, at 10 A. M., on October 4, at 45 Broad Street, Boston, Mass. Six companies submitted proposals as follows: Robins, $47,970, 38 days; Morse, $47,955, 40 days; Bethlehem, $48,750, 43 days; Atlantic Works, $49,789, 39 days; W. &. A. Fletcher, $50,000, 40 days; Newport News, $52,940, 32 days.

Repairs, Los Angeles, Cal.—According to information from Los Angeles, Cal., damage to the steamer Virginia Olson, which collided with the steamer Claremont in the Los Angeles Harbor recently, is estimated at more than $30,000. It is said that oil tanks and bulkheads amidships must be removed before work can proceed on replacement of the damaged hull. It has also been announced that the steamers Meriden and Olympic have been ordered reconditioned with wider hatches, changed decks and other improvements. The work on the Meriden will cost $45,000, with extras mounting to perhaps $60,000. It has been stated that the vessels, which are already able to unload in three and one-half days, will be able to cut that time almost in half when improved.

SHIPYARDS AND DRY DOCKS

New Drydock, New Orleans, La.—The Johnson Iron Works, New Orleans, La., have a new drydock, 416 feet 3 inches long and 75 feet between wings, with a lifting capacity of 7,000 tons.

Drydock, Chester, Pa.—The Sun Shipbuilding Company has been negotiating for the purchase of one of the 10,000-ton drydocks owned by the Shipping Board, which is to be towed to Philadelphia. President Pew has admitted the company has taken the drydock under a lease with an option of purchase.

Union Shipbuilding Company Reorganizes Repair Department.—Word comes from the Union Shipbuilding Company, Baltimore, Md., of the company's reorganization of their Repair Department for the purpose of actively engaging in the repairing and drydocking of vessels up to 420 feet in length and 5,000 tons displacement while light.

Cannery Buys Shipyard.—Word comes from Seattle that the wooden shipbuilding plant at Houghton Lake, Washington, originally known as the Anderson Yard, has been purchased by the Alaska Consolidated Canneries from the Lake Union Drydock and Machine Works. The new owners will continue the yard in commercial business.

Shipping Board Dry Docks Leased.—Besides the leasing of one of the 10,000-ton drydocks of the Shipping Board to the Sun Shipbuilding and Drydock Company, Chester, Pa., the Shipping Board has also leased two others of the same type to the following: one dock, located at Weehawken, N. J., to the Todd Drydock & Shipbuilding Company, of New York, and the other dock, which is at Newport, R. I., to the Alderton Dock Yard, Ltd., of Brooklyn.

Drydock Purchased, Alameda, Cal.—The United States Shipping Board has sold a 16,000-ton floating drydock to the General Engineering and Drydock Company, the concern owning and operating the former Alameda Bethlehem plant. The General Engineering Company will tow the huge craft from the Atlantic to the Pacific, the drydock being the first one ever towed from the Atlantic to the Pacific Coast. The trip will require forty days or more and two Red Stack tugs will leave San Francisco bay to undertake the tow as soon as word is received from President George Armes, of the yard, that the preliminary details have been completed.

PORT IMPROVEMENTS

Pier and Derrick Plant, Owensboro, Ky.—The River Sand & Gravel Company plans to build a concrete pier with derrick.

Clam Shell Buckets, Pittsburgh, Pa.—U. S. Engineer, Pittsburgh, plans to purchase two 2-yard clam shell buckets.

Buckets, Mobile, Ala.—U. S. Engineer, Mobile, plans to purchase one 3-side orange peel bucket and one 3-yard clam shell bucket.

Canals, Fairoaks, Cal.—Beach & Cox plan 4 mile canals, 11 feet wide at top, 4 feet at bottom, 2 feet deep; 2 centrifugal pumps, 31.1 sec. foot capacity, 12-foot lift.

Dock, Creighton, Pa.—Crucible Fuel Company, Oliver Building, Pittsburgh, plans new pile and timber dock at Creighton on the Allegheny River; cost to exceed $25,000.

Port Work, Los Angeles, Cal.—The Harbor Commission of Los Angeles has awarded the contract for pier work, etc., at Wilmington, to the Griffith Company for $21,221.80.

Levee, Kaufman, Tex.—Kaufman County Levee Improvement District 4 held an election on October 13 for the purpose of voting on $175,000 bonds for improvements, alterations and repairs.

Dock, Mingo Junction, O.—Carnegie Steel Company, Carnegie Building, Pittsburgh, Pa., plans coke unloading dock, stationary crane on concrete caisson foundation, mooring piles, etc., here. $50,000.

Breakwater, Francis Harbor, N. S.—Bids will be received by R. C. Desrochers, secretary, Department of Public Works, Ottawa, Ont., for a 301-foot concrete breakwater, 20 feet wide, Francis Harbor, at $60,000.

Breakwater, Port Lorne, N. S.—R. C. Desrochers, secretary, Department of Public Works, Ottawa, received sealed proposals on October 22 for 50-foot extension to concrete breakwater, 45 feet wide, here. $27,000.

Crane, Tacoma, Wash.—Port of Tacoma, National Bank of Tacoma Building, is in the market for a 90-foot electric crane with track and necessary operating equipment. $50,000. Address G. M. Osgood, chief engineer.

Grain Elevator, Port Arthur, Tex.—Kansas City Southern Railroad, 11th and Wyandotte streets, Kansas City, Mo., is taking bids for a concrete grain elevator, 600,000-700,000 bushels, here. $25,000. C. E. Johnson, c/o owner, engineer.

Dredging, Harlingen, Tex.—Sealed proposals were received by C. Brown, secretary, Cameron Water Improvement District 1, on October 22, for dredging 8-mile canal, 60,000 cubic yards excavation, etc., in Cameron County. $25,000. A. Tamm, Harlingen, engineer.

Pontoon, New Orleans, La.—Sealed proposals were received by the Board of Commissioners of the Port of New Orleans, Suite 200, New Court Building, on October 25, for a reinforced-concrete pontoon for the Ferry Landing at the foot of Canal street. J. H. Walsh, general manager. Requisition E. D. 14101.

Waterway Opened, Lake Okeechobee, Fla.—Lake Okeechobee, the second largest body of fresh water in the United States, has been linked with the Atlantic Ocean, sixty-five miles away. The inlet, which extends from the lake to the ocean, was formally opened with fitting exercises and will be navigable to yachts and freighters drawing not more than ten feet of water.

Wall and Dike, etc., Shreveport, La.—Sealed proposals were received on October 23 by S. G. Wolf, secretary-treasurer, for 1,000 feet of sheet pile toe wall, 24 feet deep, 2,200 feet of pile dike 55 feet deep, willow fascine or plank mattress under dike 100 by 2,200 feet, 20,000 cubic yards of grading and 25,000 square feet of creosote pavement. Alternate bids on long crib filled with brush anchored to piling. C. E. Smith, Railway Exchange, St. Louis, Mo., engineer.

Erection of Ferry Landing, New Orleans, La.—The Board of Commissioners of the Port of New Orleans will receive sealed proposals at their office, Suite 200, New Court Building, until 3 P. M., November 15, 1923, for furnishing and erecting the Ferry Landing at the foot of Canal street, New Orleans, Louisiana, approximately 175 tons of structural steel for a double deck, double drive ferry bridge, and 25 tons of bridge operation machinery. J. H. Walsh, general manager. Requisition E. D. 14122.

Shed Construction, Portland, Ore.—The Commission of Public Docks, Portland, has awarded a contract to O. R. Wayman for the construction of an addition to the main shed on the quay dock at terminal No. 1, which is to extend along the west side of the shed for a width of 47 feet and length of 900 feet, and has also approved an agreement with the Eastern & Western Lumber Company for the joint dredging and maintenance of a slip between the mill property and the north end of terminal No. 1, where Pier C is to be erected. The Commission has adopted the 1924 budget that totals $1,157,770. Dredging of the new slip is to be undertaken by the Port or Portland and material removed will be used to fill part of the property, which was recently joined to the terminal holdings through purchase. Authority has been granted G. B. Hegardt, chief engineer, to advertise for the removel of part of the old piling on the river side of the land so dredging would be expedited.

GOVERNMENT WORK

Dredging, Providence, R. I.—Sealed proposals were received on October 17 at the office of the U. S. Engineer, for dredging 373,000 cubic yards in Providence Harbor.

Fill, Philadelphia, Pa.—Specification 4919—Bureau of Yards & Docks, Navy Department, Washington, D. C., plans filling back channel at Naval Hospital, here.

Bids Rejected, Pearl Harbor, H. T.—Specification 4827—The Bureau of Yards & Docks, Navy Department, Washington, D. C., rejected bids for fire protection system at Naval Operating Base, here.

Lumber, Paris Island, S. C.—Port Quartermaster, Marine Barracks, awarded the contract for 100,000 feet of lumber, various sizes, to Montgomery & Company, 10 South 15th Street, Richmond, Va. Engineers' estimate, $5,300.

Contract Awarded, Jacksonville, Fla.—U. S. Engineer, Jacksonville, awarded the contract for 25 pontoon catamarans for the dredge Barnard to Novelty Steam Boiler Works, 917 South Howard Street, Baltimore, Md., $24,350.

Piling, Owensboro, Ky.—U. S. Engineer, P. O. Box 72, Louisville, plans to purchase 500 piles, 25 feet long, and 1,000 piles, 30 feet long, not less than 12-inch butt and 8-inch tip. F. O. B. Owensboro, for Dam 46, Ohio River.

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Dredging, Oakland, Cal.—U. S. Engineer, P. O. Box 72, plans to purchase 500 pieces of 12-foot, 500 pieces of 16-foot, 1,200 pieces of 20-foot and 400 pieces of 22-foot (all 2 by 12 inches) No. 1 common yellow pine f. o. b. Addison.

Dredging, Elizabeth River, Va.—Sealed proposals were received by the U. S. Engineer Office, Norfolk, Va., on October 30, for dredging in the Eastern Branch of Elizabeth River, Norfolk Harbor, Va. Further information on application.

Lumber, Rock Island, Ill.—The contract for furnishing 237,000 feet of Douglas fir for use at Le Claire Canal Lock, etc., has been awarded by the U. S. Engineer Office to G. T. Mickle Lumber Company, 30 North La Salle Street, Chicago, at $5,037.

Dredging, Boston, Mass.—U. S. Engineer, Custom House, awarded the contract for dredging and disposing of 600,000 cubic yards of material from Beverly Harbor, to J. S. Packard Dredging Company, Turks Head Building, Providence, R. I. $24,891.

Piling, Cincinnati, Ohio.—U. S. Engineer, Cincinnati, awarded the contract for furnishing sixty 30-foot taper piles, one hundred forty-six 40-foot and sixty 35-foot steel sheet piles for Dams 34, 36 and 38, to Bethlehem Steel Company, Cincinnati, at $2.94 a hundredweight.

Discharge Pontoons, Rock Island, Ill.—Sealed proposals were received by the U. S. Engineer Office, Rock Island, on October 17, for the construction and delivery of twenty 38-foot by 14-foot by 3-foot steel discharge pontoons. Further information on application.

Dredge Pump, etc., New Orleans, La.—U. S. Engineer Office, 329 Customhouse, New Orleans, La., will receive sealed proposals until 9 A. M., November 2, 1923, for constructing and delivering one 24-inch dredge pump and suction mouthpiece. Further information on application.

Breakwater Construction, Hilo Harbor, H. T.—Sealed proposals were received by the U. S. Engineer Office, Honolulu, T. H., on October 15, for breakwater construction, Hilo Harbor, T. H. Further information on application here or to U. S. Engineer Office, 401 Customhouse, San Francisco, Cal.

Repairs, Philadelphia, Pa.—The contract for repairs to substructure and deck portions of Piers 97, 98 and 99, Greenwich Point, Delaware River, Philadelphia, has been awarded by the U. S. Shipping Board, c/o J. M. Hoffman, Head, Division of Docks and Wharves, 1907 Navy Building, Washington, D. C., to E. Fay & Son, 2 South Mole street, at $154,800.

NEW INCORPORATIONS

The Lake & Ocean Company, of Buffalo, capital $65,000, chartered under New York laws, to operate steamers. Incorporators: W. F. Delaney and L. B. Oishei.

Coal Ports Transportation Corporation of Manhattan, capital $10,000, chartered at Albany, to engage in navigation. Incorporators: J. A. Sheridan, A. E. Flanders and H. V. Boyle.

Davis Transportation Lines, Inc., capital $350,000, incorporated in Delaware to own and operate steamships. Incorporators: Robert K. Thistle, Harry C. Hand and George V. Reilly, of New York.

Philadelphia & New York Transportation Company, capital $5,000, chartered under Delaware laws to engage in the transportation of freight. Incorporators: C. B. Outter, S. B. Mackey and L. C. Christy.

Marmack Transportation Company, capital $1,500,000, chartered under Delaware laws, to operate vessels. Incorporators: James A. McDavid, Harry F. Martin, Clayton C. Wright and Stanley Safreed, of Pittsburgh.

The Inland Water Line: principal place of business, Jacksonville; capital stock, $250,000; limit of indebtedness, $1,500,000. Corporate existence 99 years. General nature of business: To own, control and acquire by lease, purchase, construct, or otherwise, steamships, boats, barges and vessels of all kinds or interests therein, and to operate the same for transportation line for passengers and freight of all kinds, etc. Officers and directors: William H. Furrow, president; Damon G. Yerkes, vice-president; J. Henry Blount, secretary and treasurer. Letters patent issued, September 25, 1923.

Florida Canal and Transportation Company; principal place of business, Jacksonville; capital stock, $3,000,000; limit of indebtedness, $10,000,000. Perpetual corporate existence. General nature of business: To acquire, have, hold, use, enjoy, exercise and operate the canals, rights of ways, waterways, and rights and privileges, franchises, immunities, machines, houses, implements, appendages, appurtenances and properties being, pertaining to or used in connection with all or any of the canals and waterways which are or were of Florida Coast Line Canal and Transportation Company, a corporation created and existing under the laws of the state of Florida, and having been conveyed or mortgaged by the Florida Coast Line Canal and Transportation Company to the Rhode Island Hospital Trust Company as trustees, etc. Letters patent issued September 11, 1923.

SHIPPING DEVELOPMENTS

Megee Brothers.—Ralph D. Megee, of Megee Brothers, has purchased the British schooner Montclair. She was sold at a United States Marshal's sale in Camden, recently.

Mallory Transport Lines.—Announcement has been made by Rogers & Webb, Boston agents for the Mallory Transport Lines, of a new steamship service between Boston and South African ports, which opened last month.

Cunard Line.—Triangular steamer service between London, Boston and Portland, which was maintained last winter by the Cunard Line, will be re-established at the close of navigation in the St. Lawrence river this winter, according to information from Boston. The Vardalia will leave London the first week in December for Boston.

Construction Materials Company.—The Construction Materials Company of Chicago has purchased two lake type steel cargo vessels from the Shipping Board. The ships are the Lake Clear, of 2,875 deadweight tons, and the Lake Weir, of 2,875 deadweight tons. The purchaser agreed to install Diesel engines in the Lake Weir by the terms of the sale.

United American Lines.—According to announcement by Christian J. Beck, vice-president in charge of freight traffic of the United American Lines, the company will have a fortnightly eastbound intercoastal service calling at Boston and Philadelphia. This service is said to be in connection with the weekly sailings between New York and Baltimore and West coast ports maintained jointly with Houlder, Weir and Boyd.

San Juan Transportation Company.—The San Juan Transportation Company, of Bellingham, Washington, has purchased the steamer Astorian, which formerly operated on the run between Portland and Astoria and which has been out of commission for about three years. This ship is an oil burner with two stacks and is of a type similar to many vessels operated on Puget Sound, being 145 feet long and approximately 100 tons burden.

MARINE SOCIETIES

AMERICA

American Society of Naval Engineers
Navy Department, Washington, D. C.
Secretary-Treasurer—Commander S. M. Robinson, U. S. N., Bureau of Engineering, Navy Department, Washington, D. C.

Society of Naval Architects and Marine Engineers
29 West 39th Street, New York
Secretary and Treasurer—Daniel H. Cox.

National Association of Engine and Boat Manufacturers
29 West 39th Street, New York City
Secretary—R. R. A. Hand.

United States Naval Institute
Naval Academy, Annapolis, Md.
Secretary and Treasurer—Commander H. K. Hewitt, U. S. N.

American Marine Association
15 Park Row, New York
President—E. A. Simmons.
Secretary—K. W. Heinrich.

The New York Tow Boat Exchange
11 Moore St., New York.
Secretary—Irving G. Keller.

Port of New York Authority
11 Broadway, New York
Chairman—E. H. Outerbridge.
Secretary—William Leary.

Marine Engineers' Supply Men's Association
Room 507, 30 Church Street, New York.
Secretary—Robert P. Jones.

National Association of Masters, Mates and Pilots
National Secretary—M. D. Tenniswood, 308 Vine St., Camden, N. J.

American Society of Marine Designers
Secretary—B. G. Barnes, 202 Kendrick Ave., Quincy, Mass.

National Marine Engineers' Beneficial Association
Headquarters 311-315 Machinists Building, Washington, D. C.
Secretary-Treasurer—George A. Grubb.

Atlantic Coast Shipbuilders' Association
1600 Walnut Street, Philadelphia, Pa.
Secretary—C. S. King.

American Steamship Owners' Association
11 Broadway, New York
President—A. G. Smith.
Vice-President and General Manager—Winthrop L. Marvin.

United States Ship Operators' Association
149 Broadway, New York
President—C. H. Potter.

National Merchant Marine Association
Munsey Bldg., Washington, D. C.
President—Hon. J. E. Ransdell.

The Maritime Association of the Port of New York
78 Broad St., New York City
President—Charles H. Potter.
Secretary—Walter F. Firth.

Lake Carriers' Association
Detroit, Mich.
Secretary—George A. Marr.

Neptune Association
21 Pearl St., New York City
Secretary-Treasurer—Captain John F. Milliken.

Ocean Association of Marine Engineers
15 Whitehall St., New York City
Secretary—Bert L. Todd.

CANADA

Grand Council N. A. of M. E. of Canada
Grand Secretary-Treasurer—Neil J. Morrison, Box 886, St. John, N. B.

GREAT BRITAIN

Institution of Naval Architects
5 Adelphi Terrace, London, W. C.

Institution of Engineers and Shipbuilders in Scotland
39 Elmbank Crescent, Glasgow.

Northeast Coast Institution of Engineers and Shipbuilders
Bolbec Hall, Westgate Road, Newcastle-on-Tyne.

Institute of Marine Engineers, Incorporated
The Minories, Tower Hill, London.

ITALY

Collegio Degli Ingegneri Naval e Meccanici in Italia

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